

**Building Urban Resilience in the Arab Region: Implementing the Sendai
Framework for Disaster Risk Reduction 2015-2030 at the Local Level**

Nuha Eltinay,

**Director of Urban Planning and Sustainable Development, Arab Urban Development
Institute (AUDI), Riyadh, KSA/ PhD, School of the Built Environment and Architecture,
London South Bank University, London, United Kingdom**

Mark Harvey,

CEO, Resurgence Urban Resilience Trust, London, United Kingdom

1. Introduction

The impact of climate change on urban livelihoods and natural biodiversity systems has long been observed worldwide. Shaped by the type of hazards and the degree of exposure, 'extensive disaster risks'¹ derived from urbanisation, environmental degradation, socio-economic inequality and poor urban governance have resulted in larger mortality rates, economic losses and physical damage. With a current population over 359 million, the Arab Region is expected to have 598 million inhabitants by 2050, and 60 million people exposed to severe hydro-geological hazards in the coastal cities (World Bank, 2015)². Causing the increase in extreme weather events severity and frequency, the number of human and infrastructure losses caused by climate change at the city level are exacerbating, especially among the urban poor, settling in the most high-risk vulnerable areas.

In April 2007 Climate Change was first established as a security issue by the United Nations Security Council. The United States Department of Defense reported that 'Climate change can act as a threat multiplier for instability in some of the most volatile regions of the world (Nordås, R. and Gleditsch, N.P., 2007). This theory is strongly embedded in the Arab Region, where the interaction between disaster risk, conflict and social vulnerability is distinctly outlined in the contexts of displacement, human rights violations, and incompetent institutional disasters risk management, in at least five of the 22 Arab countries (Syria, Iraq, Yemen, Sudan and Somalia). Associated with the lack of coping capacity, the 2018 INFORM Risk Index highlights below how the Arab countries identified here are at risk from humanitarian crises and disasters, that could overwhelm national response capacity (Figure 1), and recall for taking action for building resilience for disaster risk reduction at the local level (2018, INFORM)³. This shall then support the implementation of Sendai Framework for Disaster Risk Reduction (SFDRR), and archive Sendai target E 'to substantially increase the number of countries with national and local disaster risk reduction strategies by 2020' (UNISDR, 2015)⁴.

¹ Dodman, D, Hardoy, J, and Satterthwaite, D (2009) Urban development and intensive and extensive risk, "Background paper for the ISDR Global Assessment Report for Disaster Risk Reduction". International Institute for Environment and Development.

² [Natural disasters in the Middle East and North Africa : a regional overview](#)

³ 2018 INFORM Risk Index (<http://www.inform-index.org/>)

⁴ Sendai Framework for Disaster Risk Reduction (<https://www.unisdr.org/we/coordinate/sendai-framework>)

INFORM 2018 Risk index

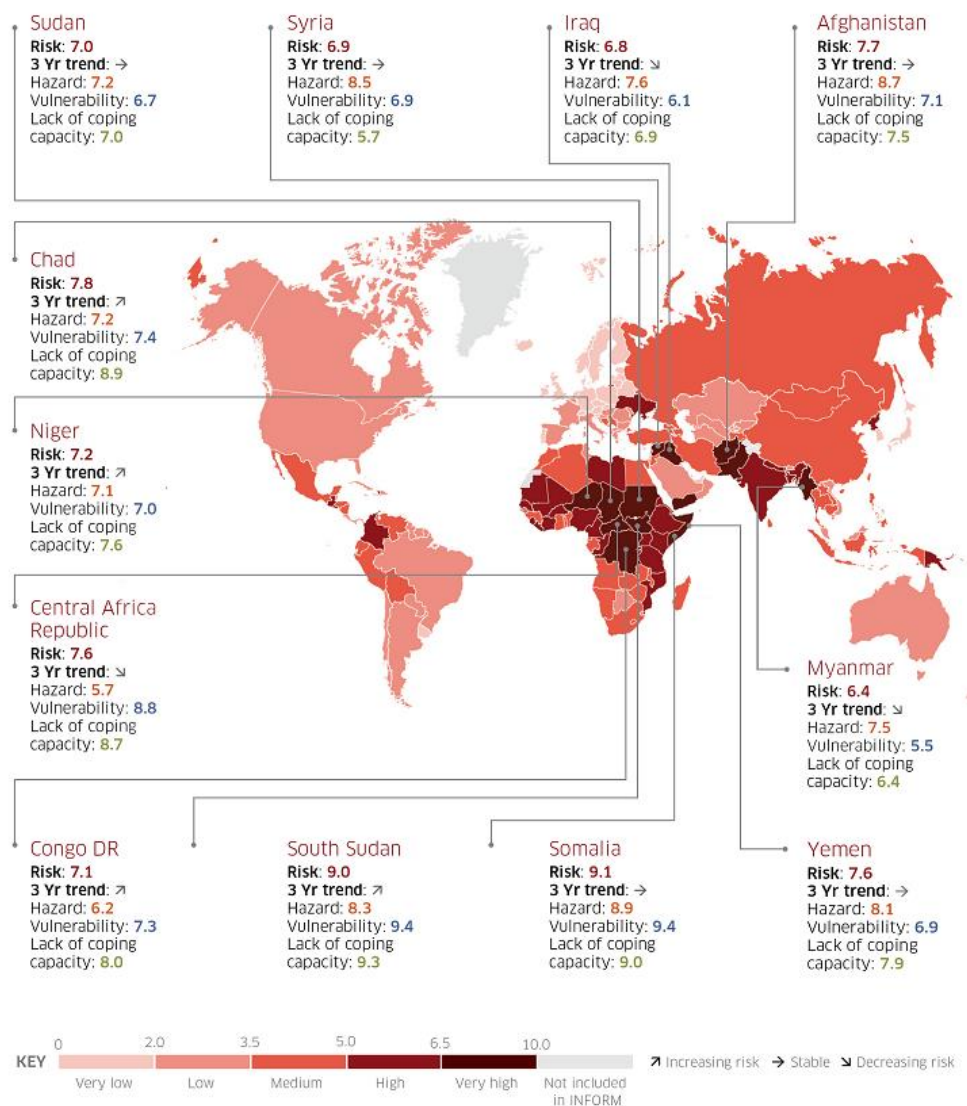


Figure 1: 12 countries with the highest overall risk of humanitarian crises and disasters (2018 INFORM Risk Index)

The SFDRR was endorsed in 2015 by the UN General Assembly as a 15-year voluntary, non-binding agreement. It lists four priorities for action and seven global targets. This agreement recognizes the State as the primary actor to reduce disaster risk, but it acknowledges that responsibility should be shared with other stakeholders, including local government and the private sector. Aimed at learning lessons from its predecessor document, the Hyogo Framework for Action (HFA) 2005-2015 to build urban resilience in the Arab Region, the present study provides an outline on a series of local consultations that took place in 25 Arab cities in 2017 and 2018. These consultations provided a platform for addressing the gaps, challenges, and achievements made with the implementation of the HFA by 2010 Making Cities Resilient Campaign partners, and provided a set of recommendations that shall allow local governments to monitor and review progress in the implementation of

the SFDRR. To do so, the United Nations Office for Disaster Risk Reduction (UNISDR) introduced a revised and updated Disaster Resilience Scorecard (2017), that serves as the reporting mechanism for local governments on the SFDRR global targets.

2. Disaster Risk Reduction at the Regional level: Background

Arab Region Key Natural Hazards: Flash floods, droughts, storms, sandstorms, earthquakes, tsunamis, landslides and sea-level rise. Different parts of the Arab region are regularly exposed to geological hazards such as earthquakes and landslides, in addition to weather related hazards such as floods, extreme temperature events, drought, sand storms, wildfires and cyclones (UNDP, 2018)⁵.

Key Risk Drivers: Poor urban planning, extreme poverty, increasing population density, rapid urbanization, ecosystem decline, climate change, conflict and security challenges.

2.1 Disaster Risk Regional strategies in the Arab States (2005 – 2015)

The 2020 Arab strategy for disaster risk reduction was first adopted by, the Council of Arab Ministers responsible for the Environment (CAMRE) in 2010. Arab States in the MENA Region committed to the implementation and follow-up on Hyogo Framework for Action 2005-2015, toward increasing the awareness and commitment to disaster risk reduction (UNISDR, 2015). (Figure 2). Recalling the 2010 World Disaster Reduction Campaign 2010-2015 Making Cities Resilient: "My city is getting ready!", observations were made in Aqaba regarding the variation in Arab cities capacities and resources to implement the declaration. Sharing equal commitments, a regional review was agreed to take place in 2015, to ensure consistency with the global disaster risk reduction framework to be adopted by 2015. Approved by the Economic and Social Council of the League of Arab States at its session in September 2011. This was followed with adoption by Arab Heads of States Summit in the Baghdad Arab Summit in March 2012. In 2013, the Cooperation Council for the Arab Gulf States (GCC) announced its commitment to develop a roadmap to reduce disaster risks.

⁵ UNDP (2018), The Arab Cities Resilience Report. Available online: www.arabstates.undp.org/content/rbas/en/home/publications.html

Disaster Risk Regional strategies – Arab Region 2005-2015

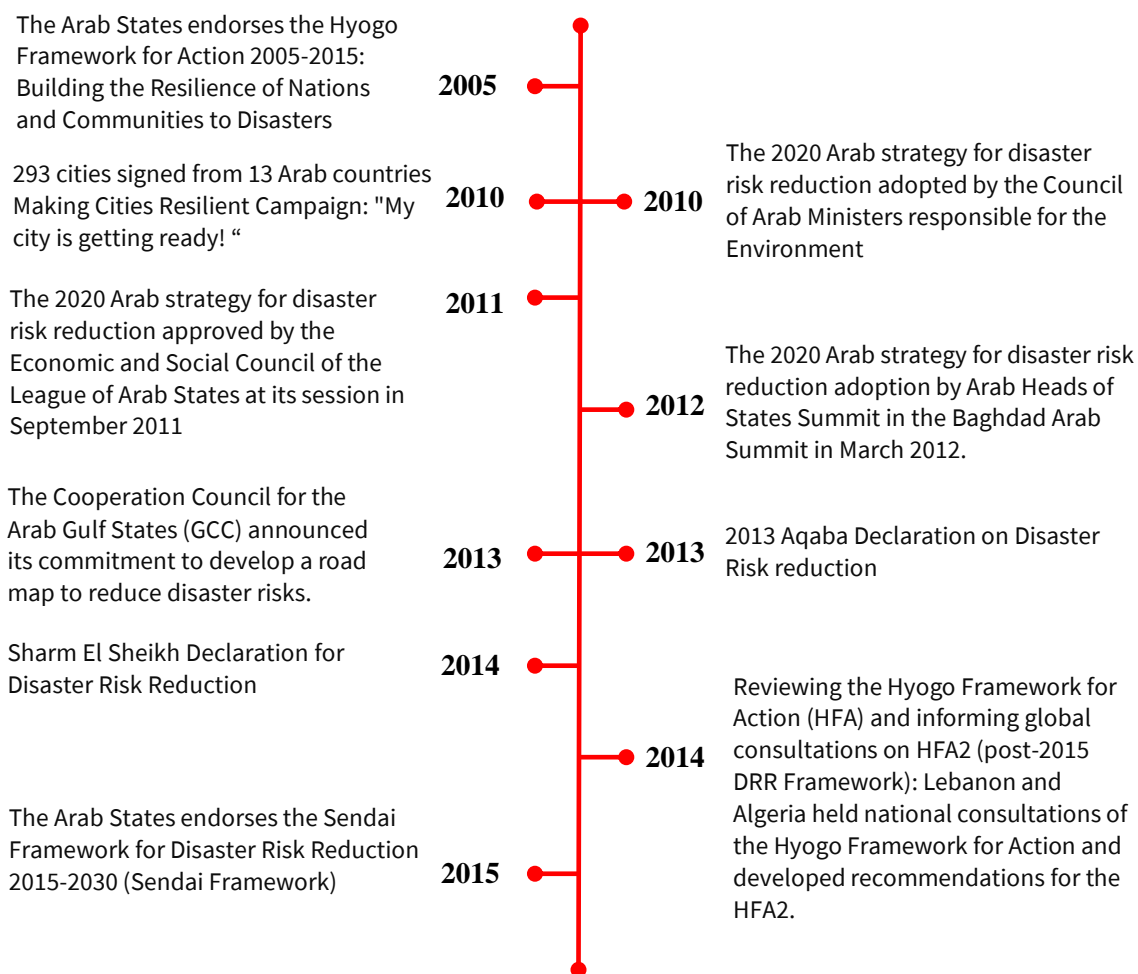


Figure 2: Disaster Risk Regional strategies – Arab Region (2005 -2015)

2.1.1) 2013 Aqaba Declaration on Disaster Risk reduction

On the same year, the Aqaba Declaration was signed at the First Arab Conference for Disaster Risk Reduction, 19-21 March in Aqaba, Jordan. Here a shift into wider collaboration at the local level was witnessed, with the engagement of Arab city mayors, local and national government representatives, working together to reduce disaster risk in Arab cities. With 16 targets set to be achieved by 2017, Aqaba Declaration recognised urbanisation challenges and opportunities associated with demographic population growth and economic development. Considering the significance of traditional knowledge in reducing disaster risk, this can be developed to strengthens the resilience of local communities. The impact of climate change extreme weather events, and exposure to hazards in coastal cities and highly seismic zones is documented.

2.1.2) 2014 Sharm El Sheikh Declaration for Disaster Risk Reduction

Adopted at the Second Arab Conference on Disaster Risk Reduction, in Sharm El Sheikh, Egypt, 14–16 September 2014, similar growing challenges of the 2014 Aqaba declaration were recognised, with 19 actions to target the lack of disaster data losses and updated information on exposure, vulnerability and hazards affecting critical infrastructure, disaster risk mitigation strategies and early warning systems. Deeper interrelationship between climate change and migration was developed with understanding of water scarcity, desertification and land degradation long-term impact, supported with facts and figures ‘Between 1980 and 2008, more than 37 million persons were affected by drought, earthquakes, flash and other floods and storms and the losses to the Arab economy were estimated at around US\$ 20 billion’ (UNISDR, 2014).

2.2 Disaster Risk Regional strategies in the Arab States (Post SFDRR 2015)

2.2.1) Doha Declaration for the 5th Global Platform for Disaster Risk Reduction

In Doha, Qatar on April 30 – May Arab States reviewed regional progress on the implementation of the SFDRR 2015-2030, worked on finalizing the Arab Strategy for DRR 2030, and agreed on a programme of work at the Third Arab Preparatory Conference on Disaster Risk Reduction. This led to the official Doha Declaration for the 5th Global Platform for Disaster Risk Reduction from the Arab States heads of government delegations, mayors, representatives of regional and international intergovernmental and non-governmental organizations, civil society, academics, scientists and youth that participated in it in Doha.

2.2.2) Tunis Declaration on accelerating the implementation of the SFDRR in the Arab Region

Adopted by the Ministers and Heads of Delegations responsible for Disaster Risk Reduction in Africa and Arab States, this declaration took place as part of the Africa-Arab Platform on Disaster Risk Reduction, in Tunis, Republic of Tunisia on 13 October 2018. Bringing together delegates from Africa and Arab States to share experiences, good practices and lessons learned, the declaration focuses on accelerating the implementation of the Sendai Framework and the Regional Strategies for Disaster Risk Reduction, adopting the Monitoring and Reporting Framework for the Programme of Action for the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in both regions. Nevertheless, it highlighted more the ever the increasing vulnerability to disasters risk in states emerging from conflicts, and the impact of climate change on accelerating the scale of protracted displacement, calling for durable solution for sustainable development.

3. Disaster Risk Reduction at the Local level: Making Cities Resilient

Campaign

The 'Making Cities Resilient Campaign'⁶ was developed by the UNISDR and its partners to assist local governments in assessing their progress in building disaster risk resilience. It is part of a series of tools for measuring the progress of nations and communities towards meeting the objectives of the HFA to 'increase understanding and encourage commitment by local and national governments to make disaster risk reduction and resilience a policy priority and to bring the global Hyogo Framework closer to local need' (HFA, 2005-2015). This was followed with the launch of the Local Government Self-Assessment tool ⁷(LGSAT) in April 2012, to enrich understanding of disaster risk, identify gaps in planning policies and financial risk investments. This is an online tool that identifies Ten Essentials for cities to build capacity toward and implement for greater resilience. Wide in scope, more than 1850 cities from 95 countries participated, and 293 cities signed from 13 countries in the MENA Region (Arab States) (UNISDR, 2013). With forty cities identified as role models to share knowledge and learn lesson from, only four are reported by the UNISDR in the MENA Region, including Dubai (United Arab Emirates), Aqaba (Jordan), Beirut and Byblos (Lebanon). Due to the lack of accurate, updated and reliable data on disaster losses in the region, these figures proclaim the necessity to identify the gaps in processing the LGSAT tool in the Arab States and understand the methodological framework for progress in monitoring and feedback for local governments (Eltinay N., International Conference on Sustainable Futures 2017). The main regional resources are the International Disaster Database (EM-DAT) and the multi-stakeholder initiative on Disaster Information Management System (DesInventar). 'That enable countries to analyse disaster trends and their impacts in a systematic manner through the collection of historical disaster data'. Nevertheless, 'only 9 out of the 22 Arab countries have either completed or initiated the development of national disaster loss platform' (UNISDR 2013, Overview of Disaster Risk Reduction in the Arab Region).

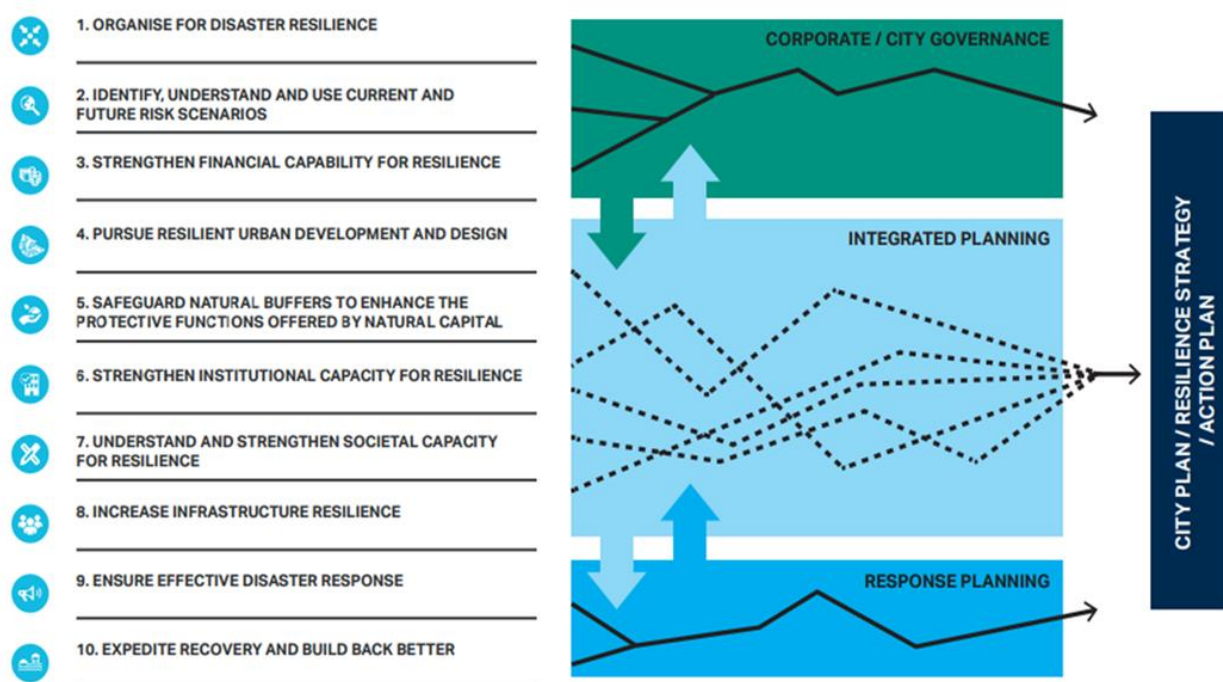
⁶ Making Cities Resilient (<https://www.unisdr.org/we/campaign/cities>)

⁷ Local Government Self-Assessment tool (<http://www.unisdr.org/applications/hfa/assets/lgsat/documents/LGSAT-Offline-Reporting-form.doc>)

3.1 Disaster Resilience Scorecard Preliminary Assessment

Structured around the UNISDR's Ten Essentials for Making Cities Resilient, the UNISDR Regional Office for the Arab States (ROAS) added a new dimension to the Making Cities Resilient Campaign with the facilitation of SFDRR strategies for assessing resilience at the local level, taking the campaign movement from an advocacy into action. The Arab Cities Assessments methodology applied Level 1: Preliminary level Scorecard tool, with a total of 47 critical sub-questions/indicators, each with a 0 – 3 score, using the new and revised UNISDR 'Disaster Resilience Scorecard for Cities' indicators⁸, launched at the 2017 Global Platform for Disaster Risk Reduction in Cancun, Mexico (Figure 3). The Scorecard is structured around the "Ten Essentials for Making Cities Resilient", first developed as part of the Hyogo Framework for Action in 2005, and then updated to support implementation of the Sendai Framework for Disaster Risk Reduction: 2015-2030. As shown in Figure 3, the Ten Essentials for Making Cities Resilient offer a broad coverage of the many issues cities need to address to become more disaster resilient (UNISDR, 2017,p.4):

- Essentials 1-3 cover governance and financial capacity;
- Essentials 4-8 cover the many dimensions of planning and disaster preparation;
- Essentials 9-10 cover the disaster response itself and post-



event recovery.

⁸ Disaster Resilience Scorecard for Cities (<https://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=4>)

Figure 3: New Ten Essentials for Making Cities Resilient (UNISDR, 2017)

Identifying gaps and learning lessons from the Arab cities reporting on the indicators for the HFA, the Arab cities disaster resilience assessment workshops paved the way for exchanging knowledge, developing evidence-based approach for reporting to the SFDRR indicators, and initiating multi-stakeholder dialogue between national and local DRR stakeholders on emerging disaster risk issues. Aligned with the ROAS activities in providing technical guidance to four countries (Egypt, Jordan, Mauritania, and Tunisia) to develop and update their national strategies and action plans in alignment with Sendai Framework, 25 cities from the Arab Region were engaged in the 'Making cities sustainable and resilient' Disaster Resilience Scorecard in city assessment consultations with the support from the European Commission.

3.2 Methodology

The selection criteria for the cities where the Disaster Resilience Assessments took place was based on detailed desk review and analytical analysis of the Arab region diversity, disaster risk challenges and opportunities. This formed in-depth understanding of the countries and shaped the selected cities disaster risk profiles. The region is exposed to two major types of natural hazards (UNISDR, 2016). The geographical distribution of cities across the western, eastern, southern and northern parts of the region was essential to have a wider investigation of DRR response to two classifications of natural hazards. First, hydro-metrological hazards defined as 'atmospheric, hydrological or oceanographic origin, such as tropical cyclones, floods, drought, heatwaves and cold spells and coastal storm surges'. This is generated by the North Atlantic Oscillation (NAO), causing storm tracks and annual variations in rainfall in Western and Central North Africa (the Maghreb), most of the Mashreq and the Arabian Peninsula. For the MENA southern parts, the Inter-Tropical Convergence Zone (ITCZ) dominates causing the Indian monsoon system (Donat, M. G., et al. 2014)⁹.

The second natural hazard is geological generated by the internal earth processes in the northern Nubia-Somalia rift zone between Eritrea, Djibouti, Somalia and Ethiopia. This result in earthquakes and volcanic hazards

⁹ Donat, M. G., et al (2014) Changes in extreme temperature and precipitation in the Arab region: long-term trends and variability related to ENSO and NAO. *International Journal of Climatology*. 34 (3), 581-592.

in this region. Anthropogenic and man-made hazards also exist at lower levels of risk (Poggi, V. et al 2017). Seismic activity is also a hazard in the Arab region. For example, the Jordan rift valley system places a number of countries (Jordan, Lebanon, Palestine and Syria) at high risk from earthquakes. Similarly, some countries in the Maghreb region (Algeria, Morocco and Tunisia) have been exposed to seismic activity in the past. Devastating earthquakes have occurred in Palestine (1927), Lebanon (1956), Morocco (1960), Egypt (1992) and Algeria (2003) (UNISDR, 2013). With variations in the type of natural hazards, extreme variations in human hazards of conflict intensity in the Arab states,

widens the disparity between the adaptive capacities of states to disasters risk. The Third Arab Governance Report Institutional Development in Post-Conflict Settings by ESCWA (Economic and Social

INFORM 2018 Vulnerability dimension

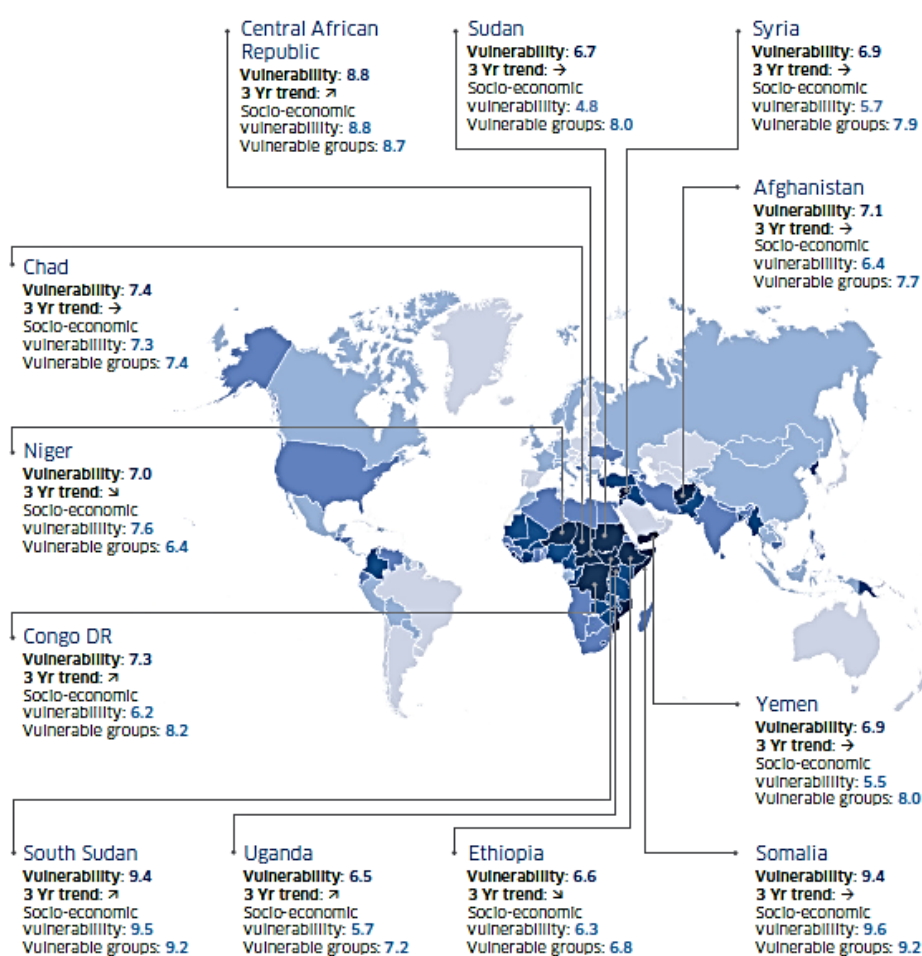


Figure 4: 12 countries with the highest overall vulnerability to humanitarian crises and disasters (2018 INFORM Risk Index)

Commission for Western Asia) indicates that 'forty per cent of Arab countries are immersed in or have lived through armed conflict in the past six years' (ESCWA, 2017) 10.

As a result, this clear distinctions should be formed in understanding the underlying drivers of risk, and levels of vulnerabilities between the Mashreq sates (Eastern) consisting of (Egypt, Iraq, Jordan, Lebanon, Palestine (West Bank and Gaza), Syria, Iran), the Maghreb (Western) (Algeria, Libya, Morocco, Tunisia, Mauretania), the Gulf Cooperation Council (GCC) countries in the Arabian Peninsula consisting of (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates), and the Southern Tier countries: (Somalia, Sudan, Comoros, Djibouti and Yemen). This is evident from the 2018 INFORM Vulnerability Index where the same four Arab countries (Sudan, Somalia, Syria and Yemen) highlighted in the Risk Index, fall into the highest values of the World's twelve most vulnerable countries (Figure 4) above.

The first set of workshops were led by UNISDR ROAS and UNDP took place in 5 Tunisian cities (Bousalem - Gabes - Kasserine - Mateur – Siliana) for the period 26-28 July 2017 and 5 Mauritanian cities (Boghe - Kaedi - Nouakchott Tavragh Zeina - Rosso – Tintane) on the 23 Aug 2017. This involved the integration of Human Security Concept in DRR under the title “Enhancing community resilience and human security of vulnerable communities in urban settings through the implementation of Sendai Framework for Disaster Risk Reduction 2015-2030”. The project aimed at helping vulnerable communities to develop capacities of the local institutions to enhance their Human Security through the seven security dimensions covering economic, food, health, environment, personal, community and political. This initiative will be one of the first projects of its kind to implement the SFDRR with the human security concept and its dimensions.

¹⁰ ESCWA (2017), The Third Arab Governance Report Institutional Development in Post-Conflict Settings. Towards peaceful, inclusive societies and accountable institutions. Available Online <https://www.unescwa.org/sites/www.unescwa.org/files/publications/files/arab-governance-report-2017-english.pdf>

The Arab Urban Development Institute¹¹ and Resurgence Urban Resilience Trust¹², jointly led the second set of Cities Disaster Resilience consultations in Khartoum, Sudan for the period 3-5th Oct 2017, followed with Amman, Jordan meeting from 4-5th November 2017. The scorecard preliminary assessments applied in those two meeting took place as part of the UNISDR 'City-to-City Learning Exchange Programme'¹³ to create a platform for learning organizations and promote a dialogue among the Arab local governments to improve city resilience action plans. This was followed with a National Resilience Assessment Workshop took place in Khartoum (29th – 30th April 2018) for ten Sudanese States - Capital cities (North Kordofan - West Kordofan - Red Sea - Sinar - River Nile Estate - Kasala - Northern State - White Nile - Algadaref - Khartoum). A closing consultation then took place in London, United Kingdom for the 9th-10th May 2018 to support the Arab capacity for shifting from resilience assessments into understanding the principles of developing urban resilience action plans, and set priorities for Smart Cities innovative solutions adopted by the London Royal Borough of Greenwich. This Workshop brought together Muscat - Sultanate of Oman, Tripoli - Lebanon, Riyadh and the Eastern province from KSA.


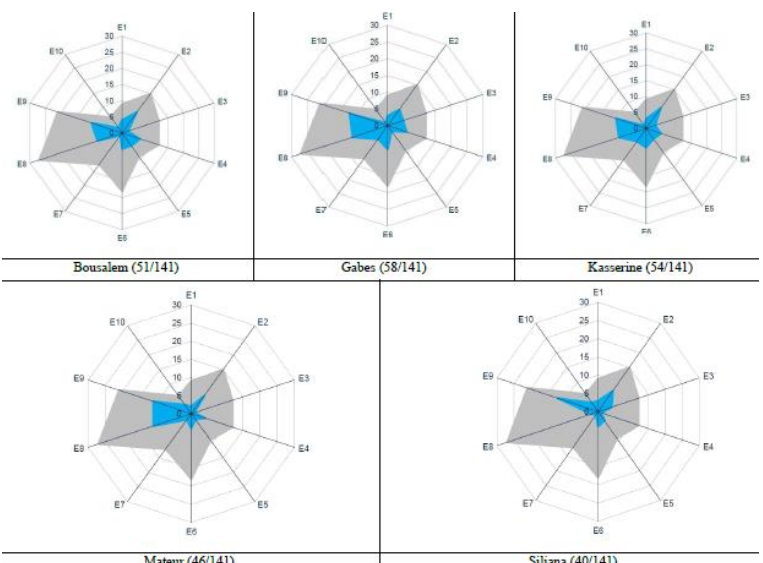
3.3 Results: From Table 1 below, a general overview of the Arab cities scorecard results for each essential is outlined, with highlights of the highest scoring cities for each sub indicator. This paper provides a statistical analysis and a summary of the results of the Scorecard preliminary assessments in the 25 cities with focus on the lessons learned, and future projects related to the development and implementation of risk-informed city resilience action plans. Effective monitoring and frequent updating of datasets was highlighted as the main challenge for improving disaster coping capacities, as well as the engagement of a variety of in-country city level stakeholders to ensure that cities' resilience action plans are backed up by sustainable investments and contribute to the mainstreaming of climate change adaptation and disaster risk reduction in the Arab Region.



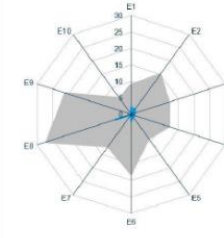
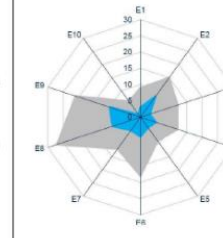
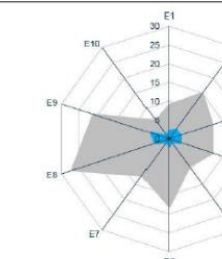
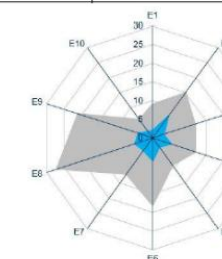


Table 1: Arab cities scorecard results - New Ten Essentials	
County	City/Cities


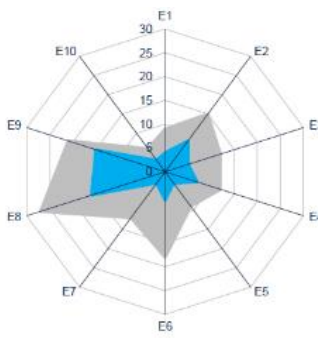

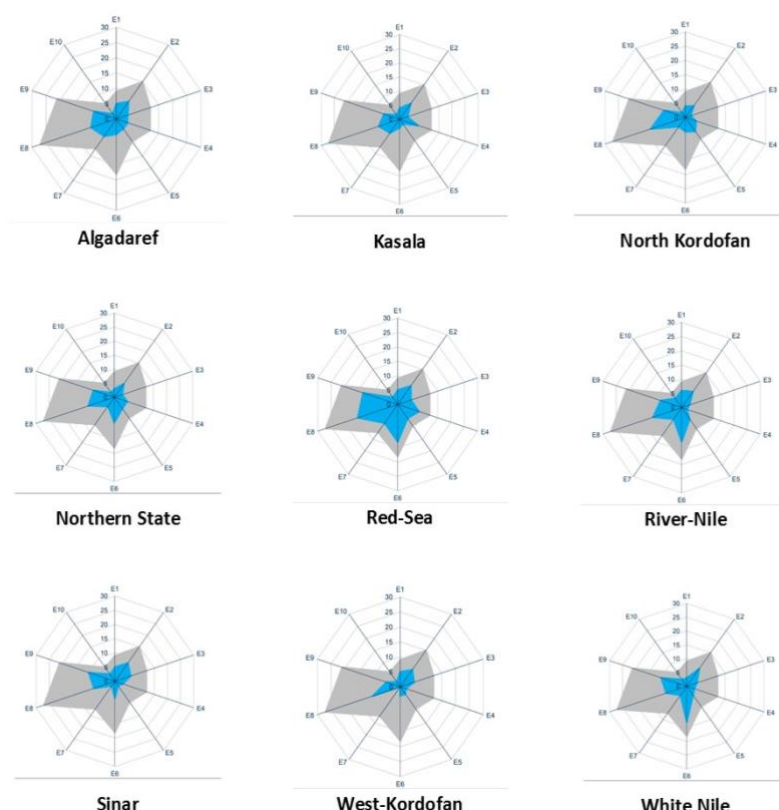
¹¹ Arab Urban Development Institute (http://www.araburban.org/index.php?page_id=187)


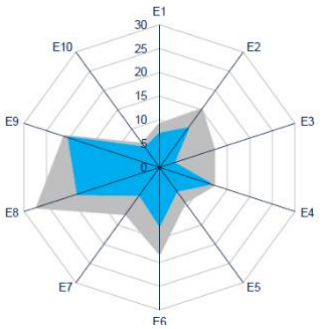

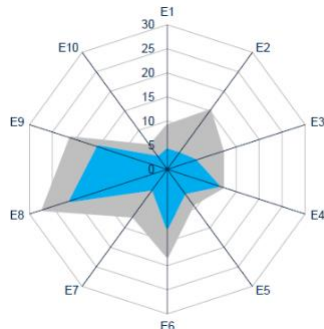

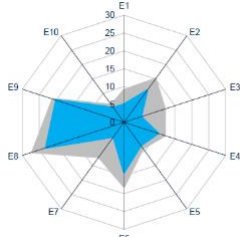
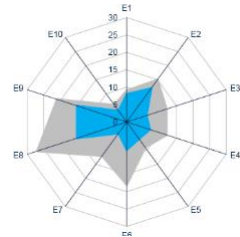
¹² Resurgence Urban Resilience Trust (<https://resurgencedata.com/>)

¹³ Tjandradewi B. et al, (2011). Building Local Government Resilience through City-to-City Cooperation, Climate and Disaster Resilience in Cities (Community, Environment and Disaster Risk Management. Emerald Group Publishing Limited, (6) pp.203 - 224

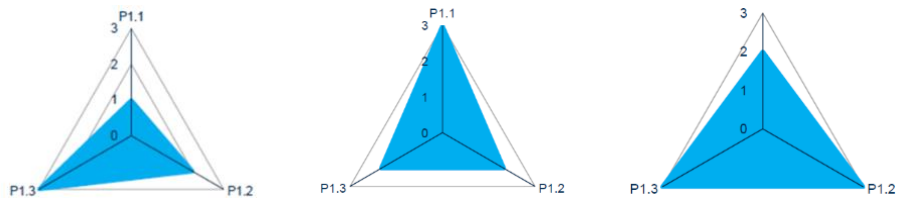
<p>TUNISIA 26-28 July 2017</p> 	<p>Bousalem - Gabes - Kasserine - Bizerte - Siliana</p>  <p>Figure (2): Overall assessment score. : Ideal Overall score. : Existing Overall score.</p> <p>LOCATIONS: South, East, North and middle in addition coastal and mountainous areas</p> <p>CONCEPT: Human security concept/Seven security dimensions: economy, food, health, environment, personal, community and political.</p> <p>PARTICIPANTS: Selection of cities in consultation with UNDP offices</p> <p>LOCAL PARTNER: Ministry of Local Development and Environment</p>
<p>MAURITANIA 23 Aug 2017</p>	<p>Boghe - Kaedi - Nouakchott Tavrigh Zeina - Rosso - Tintane</p>

 <p>Resource: http://maps.worldbank.org</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Boghe (15/141)</p> </div> <div style="text-align: center;">  <p>Kaedi (14/141)</p> </div> <div style="text-align: center;">  <p>Nouakchott (42/141)</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <p>Rosso (25/141)</p> </div> <div style="text-align: center;">  <p>Tintane (41/141)</p> </div> </div> <p>Figure (2): Overall assessment score. : Ideal Overall score. : Existing Overall score.</p> <p>LOCATION: South, and South West. In addition, two of the cities are coastal.</p> <p>CONCEPT: Human security concept/Seven security dimensions: economy, food, health, environment, personal, community and political.</p> <p>PARTICIPANTS: Selection in consultation with UNDP offices</p> <p>LOCAL PARTNER: Ministry of Environment and Sustainable Development</p>
<p>SUDAN 3 - 5 Oct 2017</p>  <p>Resource: http://maps.worldbank.org</p>	<p>Khartoum</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>LOCATION: Central - River Flooding</p> <p>CONCEPT : City to City Learning Exchange - Urban Refugees Crisis</p> <p>PARTICIPANTS: Selection in consultation with UN Habitat</p> <p>LOCAL PARTNER: Ministry of Infrastructure - Roads and Bridges</p> </div> </div>
	<p>Amman</p>

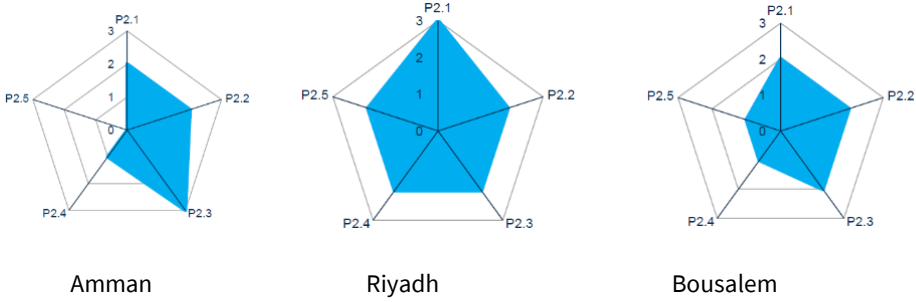
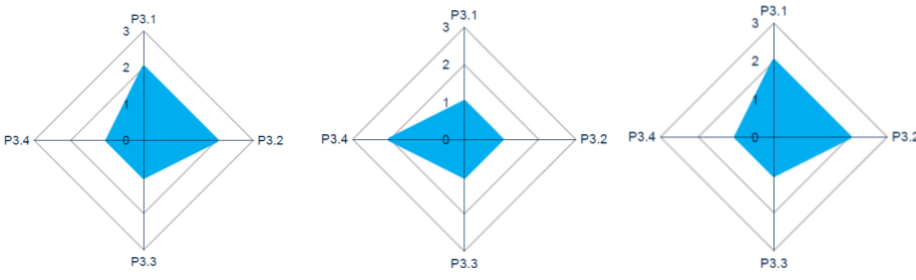
<p>JORDAN 3 - 5 Nov 2017</p>  <p>Resource: http://maps.worldbank.org</p>	 <p>LOCATION: Central - Flash Flooding</p> <p>CONCEPT : City to City Learning Exchange - Urban Refugees Crisis</p> <p>PARTICIPANTS: Selection in consultation with UN Habitat</p> <p>LOCAL PARTNER: Greater Amman Municipality (Amman Resilience Strategy - 100 Resilient Cities)</p>
<p>SUDAN 29 - 30 April 2018</p>  <p>Resource: http://maps.worldbank.org</p>	<p>North Kordofan - West Kordofan - Red Sea - Sinar - River Nile Estate - Kasala - Northern State - White Nile</p>  <p>Algadaref Kasala North Kordofan</p> <p>Northern State Red-Sea River-Nile</p> <p>Sinar West-Kordofan White Nile</p>

<p>OMAN 9 - 10 May 2018</p>  <p>Resource: http://maps.worldbank.org</p>	<p>Muscat</p> <p>LOCATION: Coastal - Cyclones</p> <p>CONCEPT : Smart and Resilient Cities</p> <p>PARTICIPANTS: Selection in consultation with Resurgence</p> <p>LOCAL PARTNER: Royal Borough of Greenwich</p> 
<p>LEBANON 9 - 10 May 2018</p>  <p>Resource: http://maps.worldbank.org</p>	<p>Tripoli</p> <p>LOCATION: Coastal – Floods and Earthquakes</p> <p>CONCEPT : Smart and Resilient Cities</p> <p>PARTICIPANTS: Selection in consultation with Resurgence</p> <p>LOCAL PARTNER: Royal Borough of Greenwich</p> 
<p>KSA 9 - 10 May 2018</p>  <p>Resource: http://maps.worldbank.org</p>	<p>Riyadh - Eastern Province</p> <p>LOCATION: Inner lands- Flash Floods and Sand Storms</p> <p>CONCEPT : Smart and Resilient Cities</p> <p>PARTICIPANTS: Selection in consultation with Resurgence</p> <p>LOCAL PARTNER: Royal Borough of Greenwich</p>  <p>Riyadh</p> 

3.4) Data Analysis: Following the general overview for the scorecard results reported by the 25 cities above, a detailed analysis for the average score results achieved is outlined below (Table 2) showcasing the highest scores achieved for three cities across the sub-indicators for each essential. This helped in shedding the light on the challenges and opportunities occurring at a regional scale, while understand the impact of institutional, infrastructural and socio-economic coping capacities in building urban resilience for DRR.

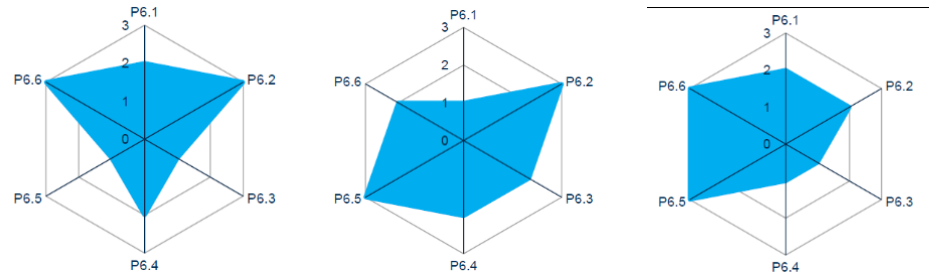
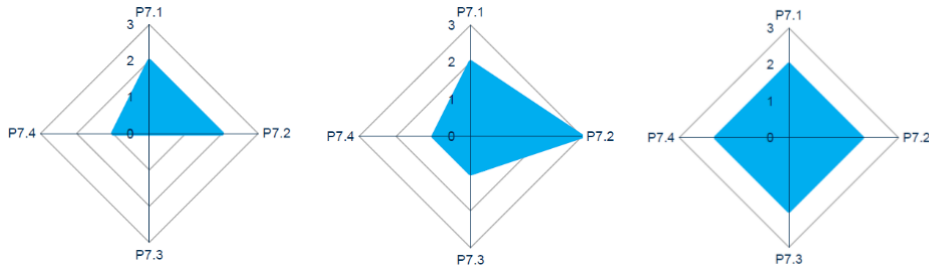
Table 2: New Ten Essentials – Average Score results analysis	
Ten Essentials	Cities (Highest scores)
ESSENTIAL 1 Organize for Resilience	 <p style="text-align: center;"> River Nile State Muscat Eastern Province </p>
Average score -1	<p>The highest score results for Essential 1 are reported for (River Nile State) Sudan, (Muscat)Oman and (Eastern Province) KSA. Distinction between DRR adaptive capacities and risk governance between the region’s developed countries (Oman and KSA) is made in compare to Sudan, as one of the Arab state Least developed countries (LDCs) which are characterized by ‘low per capita income, poor social and human development and, frequently, disadvantageous geographical locations’¹⁴ . This is justified with the support provided by International Aid Agencies for the state in integrating resilience into key city functions, and decision-making process for policy and budget proposals(Sub indicator 1.3).</p>


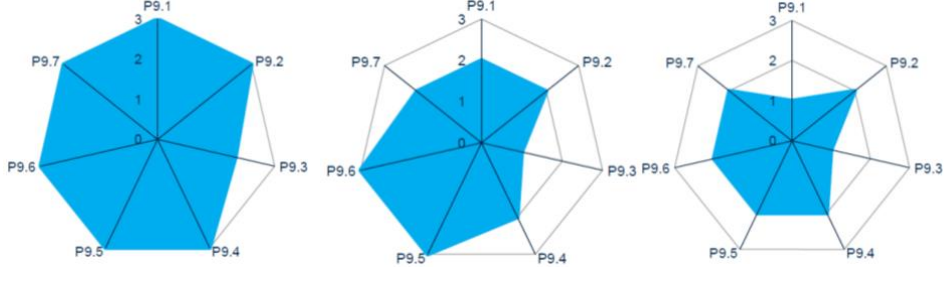
¹⁴ ESCWA (2018), Implementation of the Istanbul Programme of Action for the Arab Least Developed Countries for the Decade 2011 to 2020: Productive Capacity progress and challenges in Mauritania, Sudan and Yemen Available Online: <https://www.unescwa.org/our-work/arab-least-developed-countries>

<p>ESSENTIAL 2</p> <p>Identify, Understand and Use Current and Future Risk Scenarios</p>	 <p style="text-align: center;">Amman Riyadh Bousalem</p>
<p>Average score -2</p>	<p>The highest scores achieved for Essential 2 by Amman (Jordan), Riyadh (KSA) and Bousalem (Tunisia) all ranged around having shared understanding of risk, that requires strategic actions for implementation and constructive updates, nevertheless the case study of Amman provide evidence that the city local authority experience in developing Amman Resilience action plan as part 100 Resilient Cities initiative pioneered by the Rockefeller Foundation (100RC) Network¹⁵, helped equip DRR stakeholders with comprehensive data on disaster risk scenarios, with relevant background information for identifying hazards, exposures and vulnerabilities in at least the “most probable” and “most severe” (“worst-case”) scenarios, that is updated at agreed intervals (Sub indicator 2.3)</p>
<p>ESSENTIAL 3</p> <p>Strengthen Financial Capacity for Resilience</p>	 <p style="text-align: center;">Sinar Gabes Tripoli</p>

¹⁵ 100 Resilient Cities initiative pioneered by the Rockefeller Foundation (100RC) Network. <https://www.100resilientcities.org/cities/>

<p>Average score -1</p>	<p>The highest scores achieved for Essential 3 by Sinar (Sudan), Gabes (Tunisia) and Tripoli(Lebanon) varies between cities having financial plans that allow for DRR activities, with protected budgets (Sub indicator 3.2) and the provision of incentives for different sectors and segments of business and society to support resilience building (Sub indicator 3.4.). Notwithstanding, that both elements for building resilience do not meet in one city, stressing the need for assessing the significant direct and indirect costs of disasters at the local, national and regional levels, while developing innovative financing mechanisms to support capital spending decisions.</p>
<p>ESSENTIAL 4</p> <p>Pursue Resilient Urban Development</p>	<p style="text-align: center;"> Tripoli Muscat Khartoum </p>
<p>Average score -1,2</p>	<p>The highest scores achieved for Essential 4 by Khartoum (Sudan), Muscat (Oman) and Tripoli (Lebanon) indicates the strong policies are placed for promoting physical measures in new development, and enforce buildings codes or standards that address specific known hazards and regularly updated. At a more critical level of urban informality and protracted displacement, more efforts are required to achieve higher scores for (Sub indicator 4.1), with city master plan zoned according to land use, and connects well with hazards and risk mapping and demographic exposure.</p>
<p>ESSENTIAL 5</p> <p>Safeguard Natural Buffers to Enhance the Protective Functions Offered by Natural Ecosystems</p>	<p style="text-align: center;"> Nouakchott/Tavragh Zeina North Kordofan Riyadh </p>

<p>Average score -1,2</p>	<p>The highest scores achieved for Essential 5 by Nouakchott Tavrigh Zeina (Mauritania), North Kordofan (Sudan) and Riyadh (KSA) reflects the cities strength in understanding the functions on natural eco-systems beyond the cities administrative borders (Sub indicators 5.1 & 5.3). Further effort is required to promote green and blue infrastructure as part of major urban development and infrastructure projects through policy development and legislation to safeguard natural buffers.</p>
<p>ESSENTIAL 6</p> <p>Strengthen Institutional Capacity for Resilience</p>	 <p>Muscat White Nile Tripoli</p>
<p>Average score -3</p>	<p>The highest scores achieved for Essential 6 by Muscat (Oman), White Nile (Sudan and Tripoli (Lebanon) are dominated by (Sub indicator 6.5), with the availability of training materials in all of the cities' residents' common languages in use. High scores are also achieved for (Sub indicator 6.2) emphasizing the impact of formulating coordinated campaigns and programmes to ensure proper dissemination of hazard, risk and disaster information, and widen the impact of training facilities provided. This cannot be achieved without developing DRR capacities and building trust between all stakeholders with shared understanding of roles and responsibilities.</p>
<p>ESSENTIAL 7</p> <p>Understand and Strengthen Societal Capacity for Resilience</p>	 <p>Kasserine Algadaref Red Sea</p>
<p>Average score -0</p>	<p>The highest scores achieved for Essential 7 by Kasserine (Tunisia), Algadaref and Red sea</p>

	<p>(Sudan) reflects the impact of providing regular training programmes to the most vulnerable populations in the city (Sub indicator 7.2). This is strongly embedded in Sudan’s context of internal displacement caused by violent conflict and exposure to natural hazards in urban contexts, and the need for developing durable solutions for building disaster resilience.</p>
<p>ESSENTIAL 8 Increase Infrastructure Resilience</p>	 <p style="text-align: center;">Riyadh Amman Tripoli</p>
<p>Average score -1</p>	<p>The highest scores achieved for Essential 8 by Riyadh (KSA), Amman (Jordan) and Tripoli (Lebanon) reports the strength of cities infrastructural coping capacities and availability of sufficient acute healthcare capabilities to deal with expected major injuries in ‘worst case’ scenarios (Sub indicator 8.7). This is on average supported with sufficient first responder equipment through military and civilian back-up, considering critical infrastructure resilience as city priority scenarios (Sub indicator 8.1 & 8.9). On the other side, assessing the capacity and adequacy of critical infrastructure in cascading events should be considered, to avoid the ripple effect of infrastructure interdependence.</p>
<p>ESSENTIAL 9 Ensure Effective Disaster Response</p>	 <p style="text-align: center;">Muscat Eastern Province Siliana</p>
<p>Average score -</p>	<p>The highest scores achieved for Essential 9 by Muscat (Oman), Eastern Province (KSA),</p>

<p>0,1,2</p>	<p>and Siliana (Tunisia) share the cities capacities to provide supply of emergency food and basic relief items in operations centers, with participation from all agencies (Sub indicators 9.5 & 9.6). This strong disaster response is highly reflected on all sectors in Muscat, but requires further attention by other Arab cities to create and regularly update contingency and preparedness plans, communicated to all Stakeholders, and connected to innovative early warning systems to insure interoperability of emergency response, with the rapid, rational and transparent disbursement of emergency funds.</p>												
<p>ESSENTIAL 10 Expedite Recovery and Build Back Better</p>	<table border="1"> <caption>Essential 10 Scores</caption> <thead> <tr> <th>City</th> <th>P10.1</th> <th>P10.2</th> </tr> </thead> <tbody> <tr> <td>Riyadh</td> <td>3</td> <td>2</td> </tr> <tr> <td>Tintane</td> <td>2</td> <td>2</td> </tr> <tr> <td>River Nile</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	City	P10.1	P10.2	Riyadh	3	2	Tintane	2	2	River Nile	1	1
City	P10.1	P10.2											
Riyadh	3	2											
Tintane	2	2											
River Nile	1	1											
<p>Average score -1</p>	<p>The highest scores achieved for Essential 10 by Riyadh (KSA), River Nile (Sudan) and Tintane(Mauritania) indicate that expedite recovery and build back better cannot be achieved without ensuring that the recovery programmes are consistent with the long-term priorities, and sustainable development plans for disaster-affected areas and communities. This requires incorporating failure analyses and the ability to capture lessons learned (Sub indicators 10.2).</p>												

Conclusions and recommendations

According to the United Nations (UN) Population Division’s projections, urbanisation rates will escalate to reach an estimation of five billion people by 2030. Heavily concentrated in Asia and Africa low and middle-income countries, implementing the Sendai Framework for Disaster Risk Reduction (SFDRR) at local level remain a necessity to build resilience in our cities, and achieving the Sustainable Development Goal (SDG) No. 11 ‘Make cities and human settlements inclusive, safe, resilient and sustainable’. In 2010, the United Nations Office for Disaster Risk Reduction (UNISDR) launched the Scorecard Ten Essentials for ‘Making Cities Resilience’ global

campaign to increase understanding and encourage commitment of DRR and resilience policy by local and national governments. With forty cities identified as role models to share knowledge and learn lessons from, only four cities from three Arab countries were reported by the UNISDR in 2012. Thus, this study highlights the underlying risks of humanitarian crises and disasters, challenging the process of building resilience in the Arab Region, with the lack of coping capacities across the disciplines of climate change, conflict and displacement. The UNISDR Disaster Resilience Scorecard provided a set of assessments that allowed local governments to monitor and review progress and challenges in the implementation of the SFDRR and assess their disaster resilience. This helped in understanding where the challenges and opportunities occur at a regional scale, while learn lessons from DRR best practices and widen the opportunities for regional collaborations on building institutional capacities for developing cities resilience action plans.

With the use of the UNISDR Disaster Resilience Scorecard for Cities – 2017 New Ten Essentials, a comparative analysis for 25 Arab cities resilience assessment was applied, to identify the trends of response, and investigate the challenges and opportunities for implementing the SFDRR in the Arab Region at the local level. As a result, a variety of opportunity areas and solutions arose as evident of resilience building actions undertaken by the Arab cities, and also based on the 25 Arab cities resilience assessment workshops' observations and feedback received from the representatives of local authorities. These efforts center around the challenges of DRR stakeholders' engagement, data and information exchanges, governance and capacity building. The scorecard results average show that city-wide hazard maps are limited or do not exist, while updates on risk assessment are lacking with no clear multi hazard components. This challenge is often linked to disaster risk governance, as there are no mandatory legislations to maintain and update disaster data losses and hazards. Local Experience and community knowledge has been used to fill in the gaps in coping with disasters and managing risks, especially in the fragile contexts of conflict and displacement with the support of international aid agencies, but with the frequency and severity of disasters increasing, this is often not enough to predict, model, and control and sustain disaster resilience actions, against the uncertainty of climate change and weak urban governance. Further investments in updating existing hazard maps, and exposure maps detailing population segments, economic assets and housing exposed is essential to understand the scale and impact of disasters, by developing human and technical capacities to analyse data, inform the decision-making process.

The level of awareness on the concepts of Disaster Risk Reduction (DRR), and understanding the technical terminologies of the Ten Essentials varies among the participants, despite them representing the same

city authority, causing bias reflected in the ranking of responses received from the same city authority. This refers back to the lack of integration, communication and data sharing across government agencies and levels, which requires conducting multi-sectoral workshops, including all DRR stakeholders to better understand the relationship between the roles of each participating institution according to the disaster response institutional structure, and encourage better data management, holistic awareness, and cohesive planning.

Participants' knowledge and access to disaster data available was only limited the most frequent and most probable disasters, challenging the process of identifying resilience gaps for multi hazards risks. The lack of awareness of disaster economic value of losses, insurance risk modeling, and the value of natural ecosystem system was also identified as a new area of knowledge, that require building capacities and providing training on best practices and disaster mitigation actions. Exchange of experiences with other cities in different countries, regionally and internationally, shall enhance the City-to City learning impact and exchange of knowledge on building urban Resilience. There is also a great opportunity to improve local capacities through obtaining feedback from other cities' and countries' with good experiences, and support developing guidance for integrating the Scorecard results into the city resilience action plan and National DRR policies.

On the other hand, disparity between the participating cities regarding the governance of DRR at the regional, national and local platforms was recognized, following the county's adaptive capacity, DRR institutional structure and authorization of powers across the different city authorities and first responders. Risk governance component was generally weak due to a lack of resources, and limited risk management budget allocated to maintain the required state of resilience in most cities. Furthermore, there is very limited access for community participation in risk-sensitive design, construction, retrofitting, communication, education and training programs that are necessary to implement build societal resilience. Raising awareness of the importance of city resilience assessment, monitoring and improving the capacity of the representatives of the participating city institutions in the field of disaster risk management, will encourage and support the cities participation in regional and international DRR events, in order to benefit from international experiences and DRR campaigns.

An important contribution to this study is empowering the sense of leadership in building resilience for DRR in local authorities by establishing a single point of coordination, and engaging all stakeholders in framing and implementing DRR acts and laws on routinely basis, to integrate resilience qualities into existing policies. Liaising with, and building on existing connections with the private sector, aid agencies and infrastructure utility providers

will insure that resilience building investments is integrated in project prioritization, planning, design, implementation and maintenance cycles. A further action worthy of consideration is to ensure that the needs of disaster survivors and affected communities are placed at the center of recovery and reconstruction, through community engagement in participatory planning pre and post disaster, to support inclusive DRR building for all community sectors, and most importantly the urban poor, to insure the translation of resilience assessment indicators into actions, and achieve the Sustainable Development Goals (SDGs).

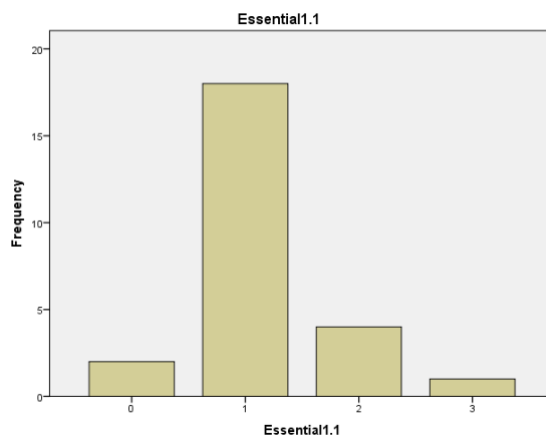
Annex 1

Table 2: Arab Cities Scorecard results for each Sub-Indicators

Essential 01: Organize for Resilience

P 1.1 Plan making

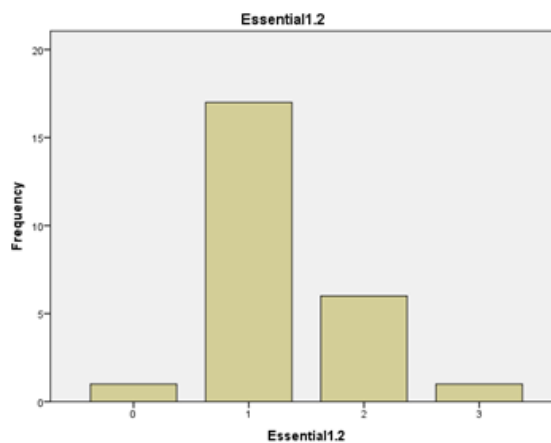
With a percentage of 72%, 18 cities out of the 25 Arab cities have responded to: 'Does the city master plan (or relevant strategy/plan) include and implement disaster risk reduction approaches in line with the Sendai Framework?' with the availability of Plans offering partial compliance with Sendai Framework and covering some of the Ten Essentials.



P 1.2 Organization, coordination and participation

The results here are similar to indicator 1.1 where 17 cities scored 1 with a percentage of 68%, responding to this question 'Is there a multi-agency/sectoral mechanism with appropriate authority and resources to address disaster risk reduction?'

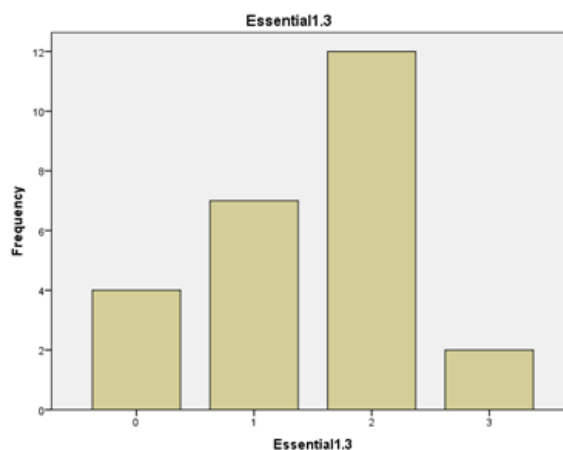
An agreement on having city teams with authority and convening power exist, but with limited inter-agency support and / or are under resourced.



P 1.3 Integration

A higher score of (2) is witnessed here from 12 cities, representing less than a half of the total number (48%), responding to this question 'Is resilience properly integrated with other key city functions/portfolios?'

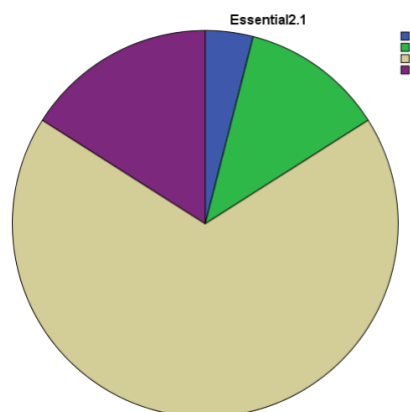
Taking into account that no formal process apply, but disaster resilience benefits are generally understood to be "helpful" to a proposal, in most functional areas.



Essential 02: Identify, Understand and Use Current and Future Risk Scenarios

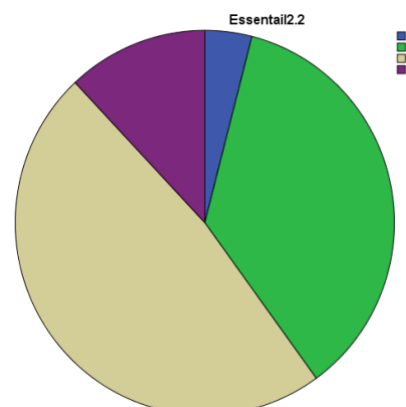
P 2.1 Hazard assessment

A majority (68%) of the 25 cities responded "Answer 2" to the question of "Does the city have knowledge of the key hazards that the city faces, and their likelihood of occurrence?" demonstrating that the cities understands main hazards, but there are no agreed plans for updating this information. Taking into account that For each hazard there needs to be identified, as a minimum, the "most probable" and "most severe" consequences?



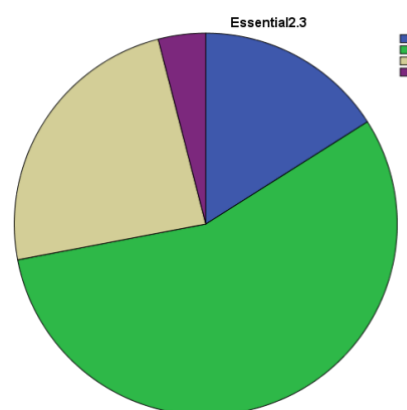
P 2.2 Shared understanding of infrastructure risk

Answering the question 'Is there a shared understanding of risks between the city and various utility providers and other regional and national agencies that have a role in managing infrastructure?' 48% of the Cities tended to have average sharing of risk information between the city and various utility providers such as power, water, roads and trains, and some consensus on points of stress (Answer 2).



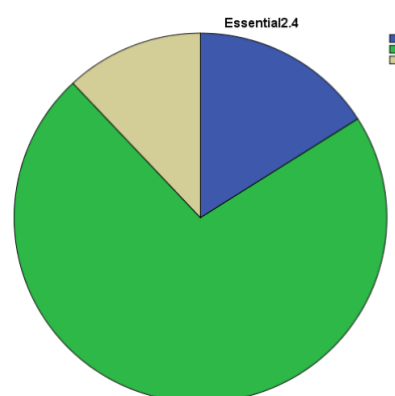
P 2.3 Knowledge of exposure and vulnerability

Over half (56%) of the cities diagnosed themselves as having low knowledge of exposure and vulnerability with availability of some disaster scenario information, in response to questions 'Are there agreed scenarios setting out city-wide exposure and vulnerability from each hazard, or groups of hazards?' (Answer 1)



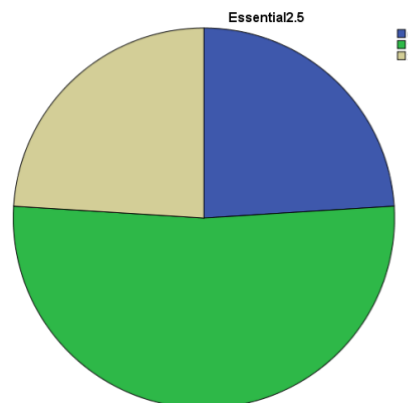
P 2.4 Cascading impacts

Over 70% of respondents noted some understanding of cascading impacts under some disaster scenarios (Answer 1) in response to the enquiry 'Is there a collective understanding of potentially cascading failures between different city and infrastructure systems, under different scenarios?'



P 2.5 Presentation and update process for risk information

The availability of risk information and hazard maps varied; for the cities that did have this information, it was not always up to date (Answer 1), responding to the enquiry ‘Do clear hazard maps and data on risk exist? Are these regularly Updated?’ Nearly a quarter of cities claimed that they did not have this information, or did not have knowledge about where to get it.

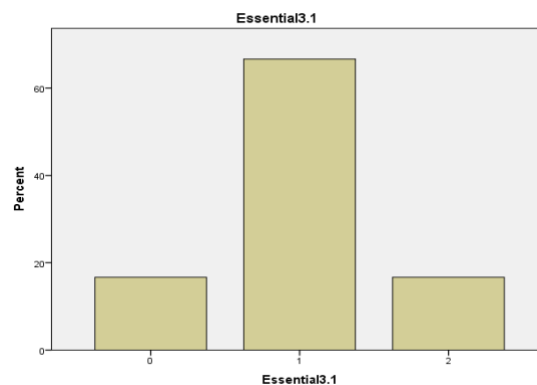


Essential 03: Strengthen Financial Capacity for Resilience

P 3.1 Knowledge of approaches for attracting new investment to the City

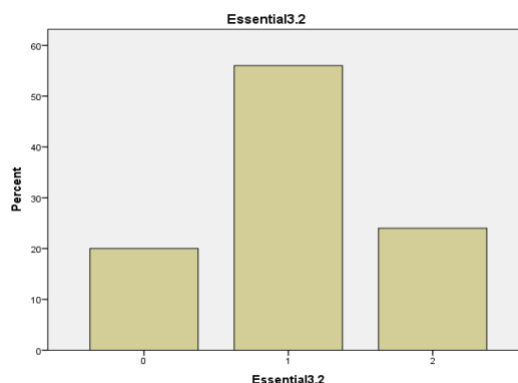
Investigating the city / lead agencies understanding of all sources of funding, and the “resilience dividends”, over 60% of the cities have some visibility of routes of funding, but picture is incomplete and little is done to pursue these funds (Answer 1)

This shall require further investment in exploring all available routes to attract external funding, and focus on pursuing funds for major resilience investments.



P 3.2 Financial plan and budget for resilience, including contingency funds

Answering the question 'Does the city have in place a specific 'ring fenced' (protected) budget, the necessary resources and contingency fund arrangements for local disaster risk reduction (mitigation, prevention, response and recovery)? 56% from the responding cities selected (Answer 1) with implies the existence of some plans in different agencies / organizations but they are not coordinated.



P 3.3 Insurance

Q: What level of insurance cover exists in the city, across all sectors - business and community?

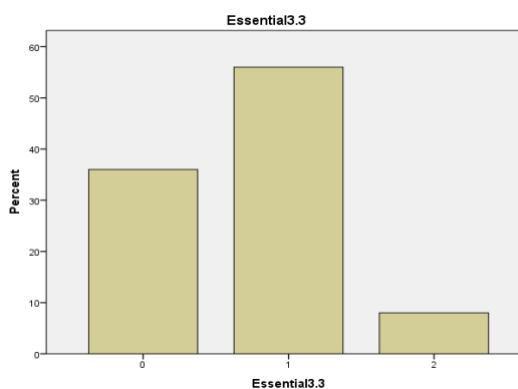
As the level of insurance varies significantly by sector or by area. Around 56% of the Arab cities are not actively promoting greater uptake of insurance products. This assessment covers both the adequacy of coverage (will insurance pay out enough?) and the extent of coverage (are enough people and businesses insured?)

Considering that the levels of insurance are for:

- domestic housing, contents and personal transport (e.g. car insurance)

- commercial and public infrastructure.

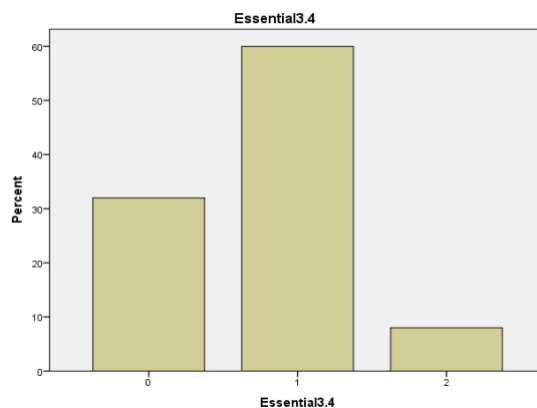
Personal health insurance is not included.



P 3.4 Incentives

Q: What incentives exist for different sectors and segments of business and society to support resilience building?

60% of the cities agree that some incentives exist, but it is patchy.

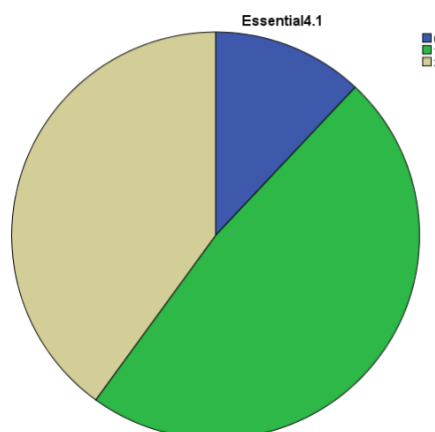


Essential 04: Pursue Resilient Urban Development

P 4.1 Land use zoning

Q: Is the city appropriately zoned considering, for example, the impact from key risk scenarios on economic activity, agricultural production, and population centers?

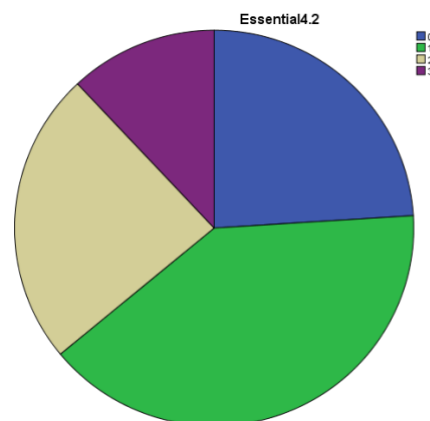
Taking into account that this assessment needs to cover informal and unplanned settlements, 48% of the cities response to this question states that zoning is not thorough / complete and is not reviewed regularly against hazards / risks. Associated with (Essential 2), effectiveness of zoning should ideally be independently validated.



P 4.2 New urban development

Q: Are approaches promoted through the design and development of new urban development to promote resilience?

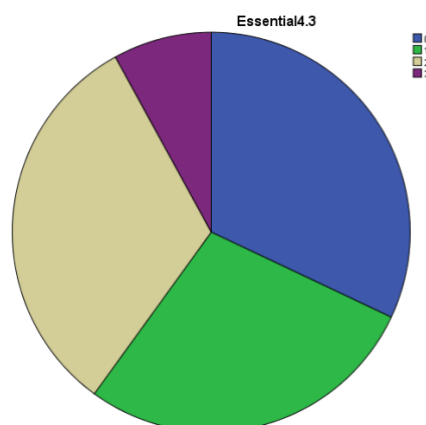
Considering the availability of policy promoting physical measures in new development that can enhance resilience to one or multiple hazards, 40% of the cities responses selected (Answer 1), where Resilience approaches are promoted, but not in a consistent manner, and not underpinned by city policy.



P 4.3 Building codes and standards

Q: Do building codes or standards exist, and do they address specific known hazards and risks for the city? Are these standards regularly updated?

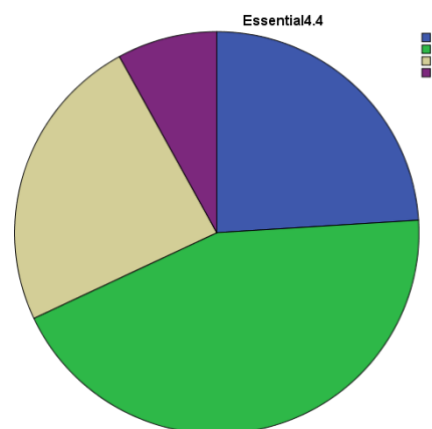
Cities response to this enquiry varies between selecting (0 for 32%) with statement that no real use / existence of relevant building codes and standards, while 32% of the cities state the existence of local codes and standards; addressing main city hazards and are regularly updated.



P 4.4 Application of zoning, building codes and standards

Q: Are zoning rules, building codes and standards widely applied, properly enforced and verified?

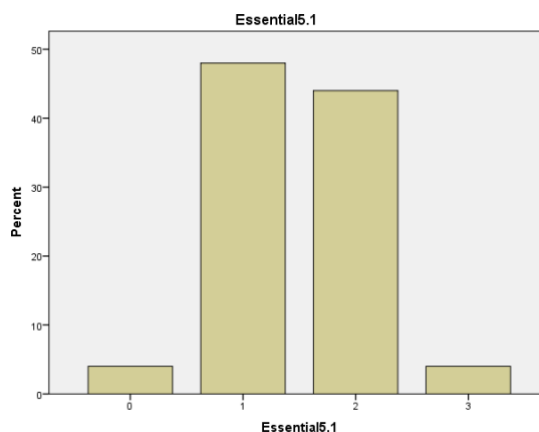
As zone verification requires proof that in any given zone, only appropriate activity is occurring, and Code verification refers to a third party check by an external body to the design and construction team, 44% of the cities selected (Answer 1) with the application of existing zones and building codes being partial and /or inconsistent.



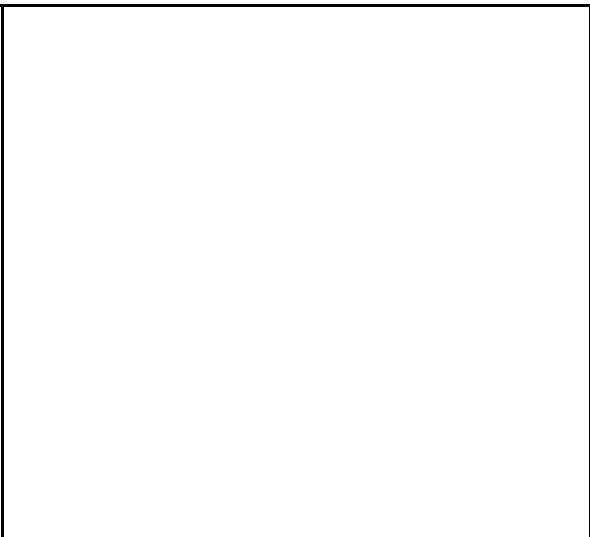
Essential 05: Safeguard Natural Buffers to Enhance the Protective Functions Offered by Natural Ecosystems

P 5.1 Awareness and understanding of ecosystem services/functions

Q: Beyond just an awareness of the natural assets, does the city understand the functions (or services) that this natural capital provides for the city? Similarities in percentage of the cities responding to this enquiry occurred, with 48% selecting the modest (Answer 1) as there is an incomplete, awareness and understanding of the functions delivered by the cities natural capital. On the other hand, 44% of the cities consider that the city and key stakeholders understand the majority of the functions provided by key local natural assets, and

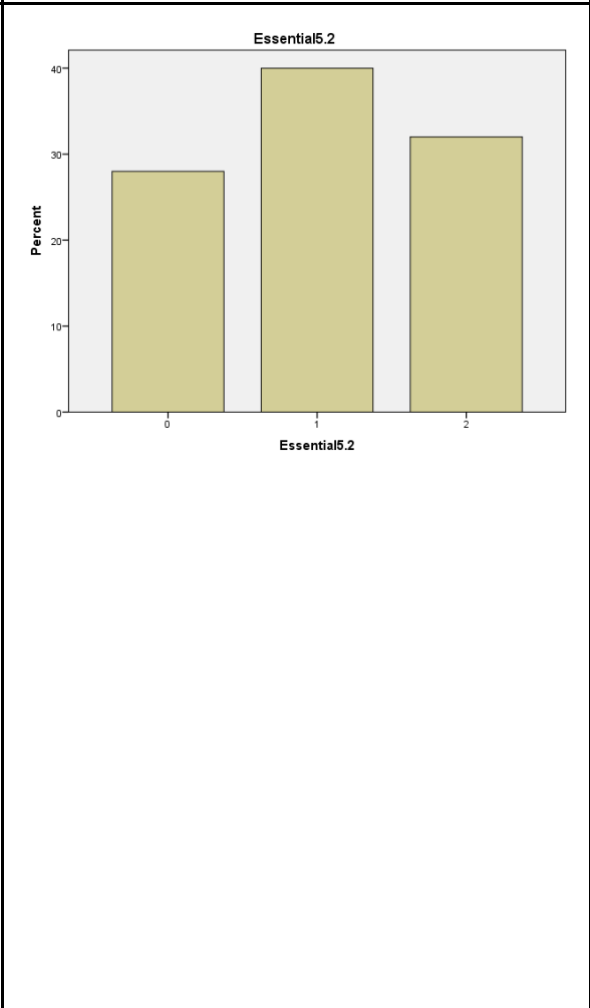


these are not economically valued.



P 5.2 Integration of green and blue infrastructure into city policy and Projects

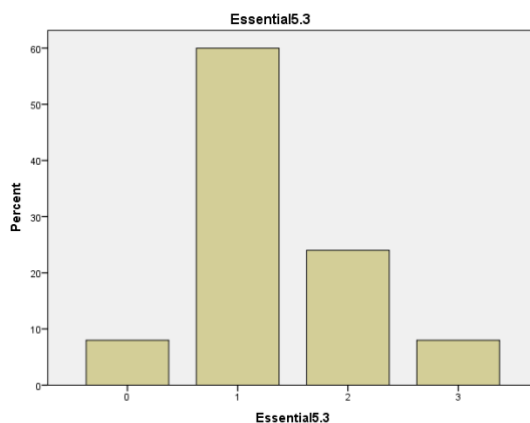
Q: Is green and blue infrastructure being promoted on major urban development and infrastructure projects through policy? 40% of the cities agree that some green and blue infrastructure is being promoted, but this is not universal and it is not supported by policy selecting (Answer 1), taking into account that Green Infrastructure includes: greening streets, squares and roadsides; greening roofs and facades, developing urban agriculture; creating urban green corridors; replace impermeable surfaces; natural water filtration; daylighting urban rivers and restoring embankments, etc. Blue Infrastructure includes: river corridors, wetlands and other waterways.



P 5.3 Transboundary Environmental Issues

Q: Is the city aware of ecosystem services being provided to the city from natural capital beyond its administrative borders? Are agreements in place with neighbouring administrations to support the protection and management of these assets?

60% of the cities have some awareness of the functions provided by natural capital beyond the city administrative borders, but has taken no action (Answer 1).

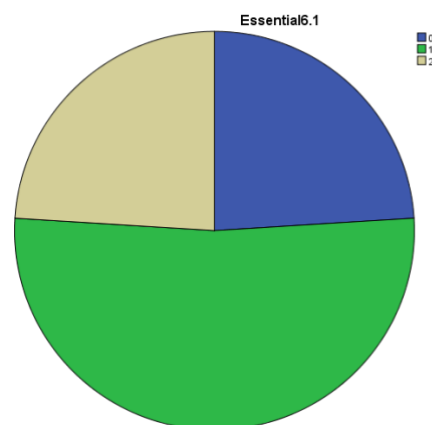


Essential 06: Strengthen Institutional Capacity for Resilience

P 6.1 Skills and Experience

Q: Does the city have clear access to all the skills and experience it believes it would need to respond to reduce risks and respond to identified disaster scenarios?

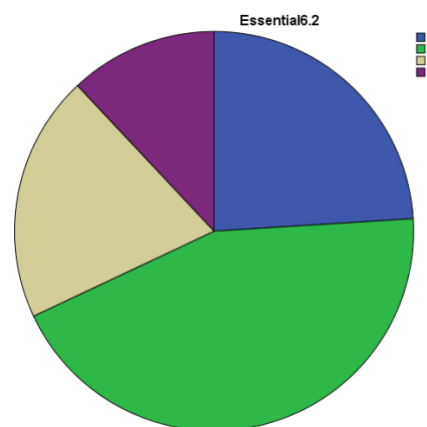
Considering the skills and experience relating to pre-event planning, and during and post-event Response, a percentage of 52% Consider that their cities can access most of the skills / experience and resources it needs to respond to identified disaster scenarios, but there are some gaps.



P 6.2 Public education and awareness

Q: Does a coordinated public relations and education campaign exist, with structured messaging and channels to ensure hazard, risk and disaster information (that can be understood and used) is properly disseminated to the public?

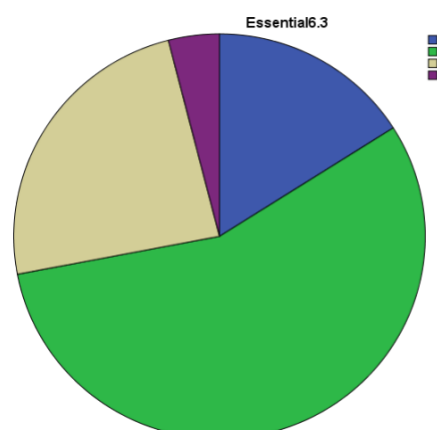
Assessing the city's ability to communicate with the public, 44.0% of the Arab cities selected (Answer 1) which states that some useful programmes / channels exist for disseminating hazard, risk and disaster information, but there is significant room for improvement to reach a greater proportion of the public. 25% of the city population is reached.



P 6.3 Data sharing

Q: Extent to which data on the city's resilience context is shared with other organizations involved with the city's resilience.

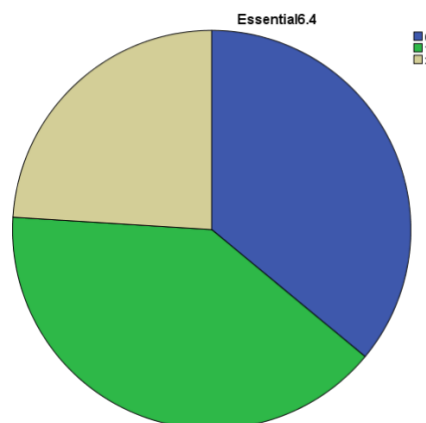
Over 50% of the cities believe that some but not all of the cities data layers are shared / accessible but the data is raw and requires interpretation. This is strongly associated with (Essential 1) considering the types of city data that are useful in understanding a city's resilience context.



P 6.4 Training delivery

Q: Are there training courses covering risk and resilience issues offered to all sectors of the city including government, business, NGOs and community?

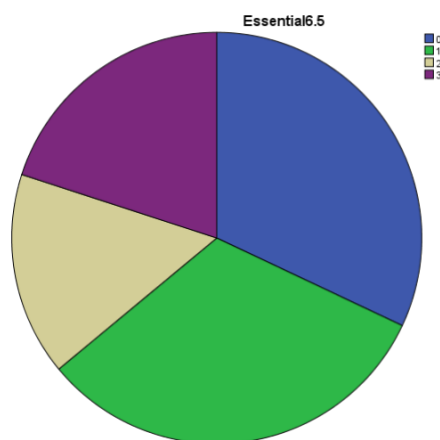
40% of the cities agree that some training modules are available, yet coverage and content needs to be significantly improved. Note that emergency response drills are covered under Essential 9. Training delivery in Essential 6 relates to professional training.



P 6.5 Languages

Q: Are training materials available in the majority of languages in common use in the city?

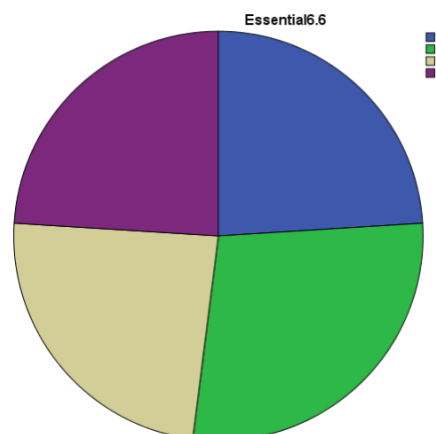
Similarities between cities responses occurred in the percentage of cities selecting Answer 0-32% (No translations have been made), and 32% percent of the cities selecting Answer 1 (All training materials are available in some of the languages common in use in the city), taking into consideration that cities with high numbers of different languages may need to settle for a selection of languages that reaches everyone as a first or second language.



P 6.6 Learning from Others

Q: Is the city proactively seeking to exchange knowledge and learn from other cities facing similar challenges?

Arab cities trend of responses to this enquiry was evenly distributed between Answer 0 - 24% (Any knowledge share that does take place relies on individuals), Answer 1- 28% (Some knowledge share happens between cities, but it tends to be ad-hoc), Answer 2- 24% (The city understands the importance of knowledge share and has membership to a range of city networks. The networks are not leveraged for maximum benefit), and Answer 3 -24% (The city proactively seeks to exchange knowledge and learn from other cities facing similar challenges and is active in a range of networks to facilitate this).



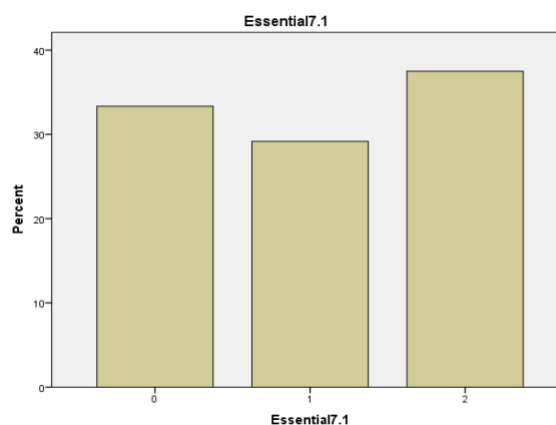
Essential 07: Understand and Strengthen Societal Capacity for Resilience

P 7.1 Community or “Grassroots” organizations, networks and training

Are grassroots or community organizations participating in pre-event planning and post-event response for each neighborhood in the city?

Cities response to this enquiry witnessed

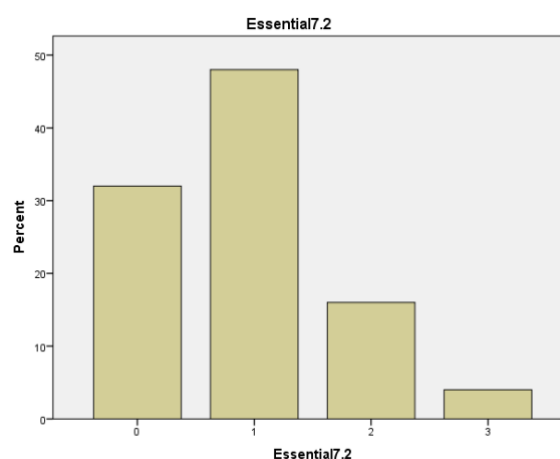
similarities between Answer 0 -with 32% of the cities answering (There is very little involvement from grassroots organizations in the city), and 36% selecting Answer 2 (There is involvement in diverse grassroots organizations, either in some locations, or in some aspect of the planning or response, but it is not comprehensive).



P 7.2 Social networks “Leave no one Behind”

Q: Are there regular training programmes provided to the most vulnerable and at need populations in the city?

48% of the cities state that ‘No training programmes, but mapping of socially vulnerable population is Available’ (Answer 1). It is important to note that Social vulnerability is the result of pre-disaster social factors that create a lack of capacity or capability to prepare for, respond to, and recover from emergencies. This includes people who are more likely to suffer disproportionately because of their existing social circumstances such as those associated with age, gender, race, medical illness, disability, literacy and social isolation.



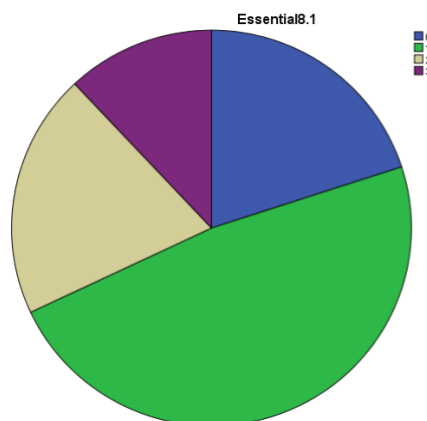
<p>P 7.3 Private sector /Employers</p> <p>Q: What proportion of businesses have a documented business continuity plan that has been reviewed within the last 18 months?</p> <p>Cities scores for this enquiry were moderately low with 60% scoring (Answer 0), as Businesses over 10 people / employees in compliance with the conditions above only represent under 20%.</p>	<table border="1"> <caption>Essential7.3 Data</caption> <thead> <tr> <th>Answer</th> <th>Percent</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>60%</td> </tr> <tr> <td>1</td> <td>24%</td> </tr> <tr> <td>2</td> <td>16%</td> </tr> </tbody> </table>	Answer	Percent	0	60%	1	24%	2	16%		
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<p>P 7.4 Citizen engagement Techniques</p> <p>Q: How effective is the city at citizen engagement and communications in relation to DRR?</p> <p>The level of citizen engagement ranged from relatively poor or no citizen engagement on DRR. (Answer 0- for 32% of the cities), and the availability of some channels, semi-regular updates (Answer 1 for 36% of the cities)</p>	<table border="1"> <caption>Essential7.4 Data</caption> <thead> <tr> <th>Answer</th> <th>Percent</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>32%</td> </tr> <tr> <td>1</td> <td>36%</td> </tr> <tr> <td>2</td> <td>20%</td> </tr> <tr> <td>3</td> <td>12%</td> </tr> </tbody> </table>	Answer	Percent	0	32%	1	36%	2	20%	3	12%
Answer	Percent										
0	32%										
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3	12%										

Essential 08: Increase Infrastructure Resilience

P 8.1 Critical infrastructure Overview

Q: Is critical infrastructure resilience a city priority, does the city own and implement a critical infrastructure plan or strategy?

48% of the cities believe that risks are understood for some but not all of the major infrastructure types
(Answer 1)



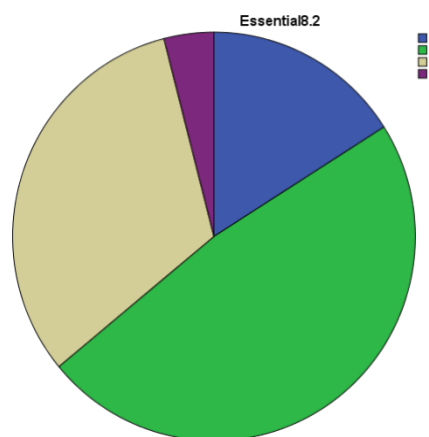
P 8.2 Protective Infrastructure

Q: Is existing protective infrastructure well-designed and well-built based on risk information?

In some cases, protective infrastructure is in place but some strategic protective infrastructure is missing. This applies for 48% of the cities with consideration that design and management may not be consistent with best practice.

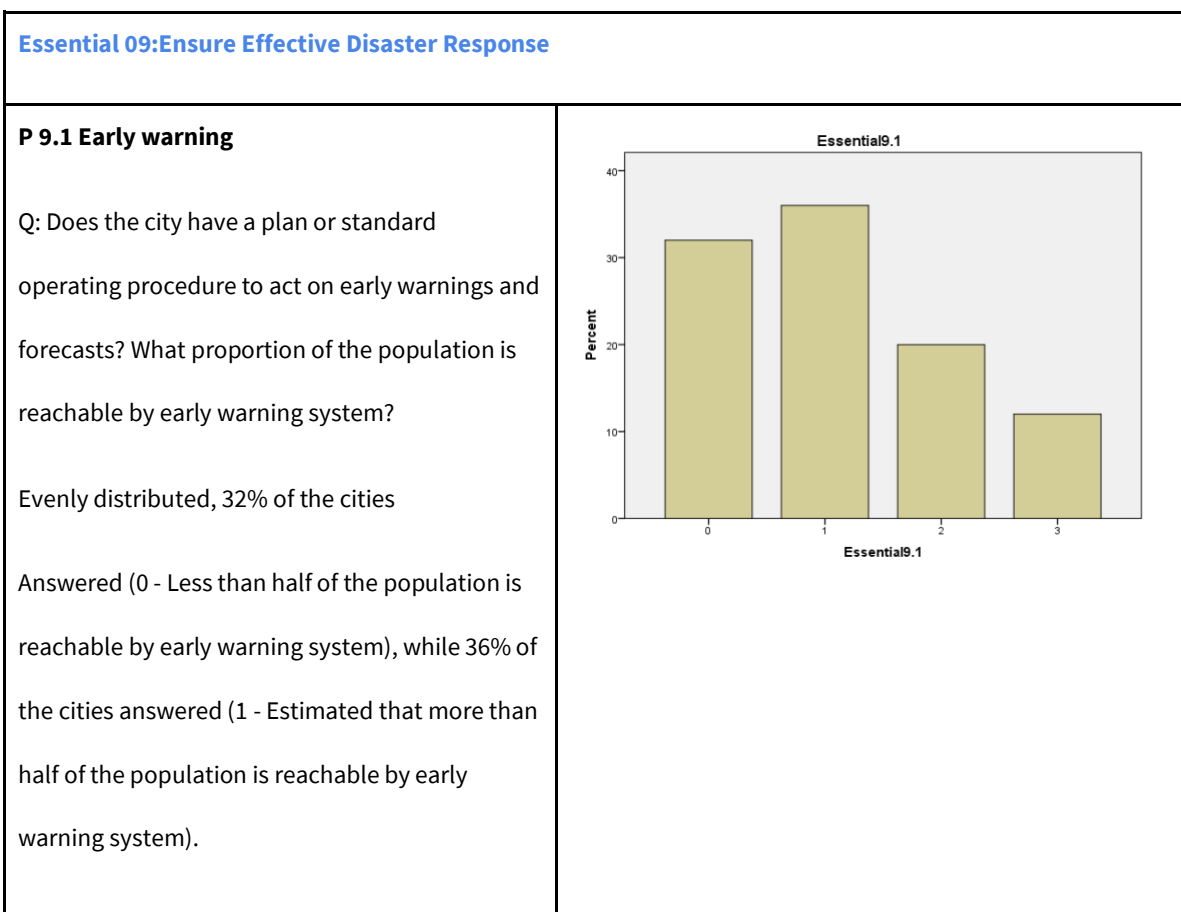
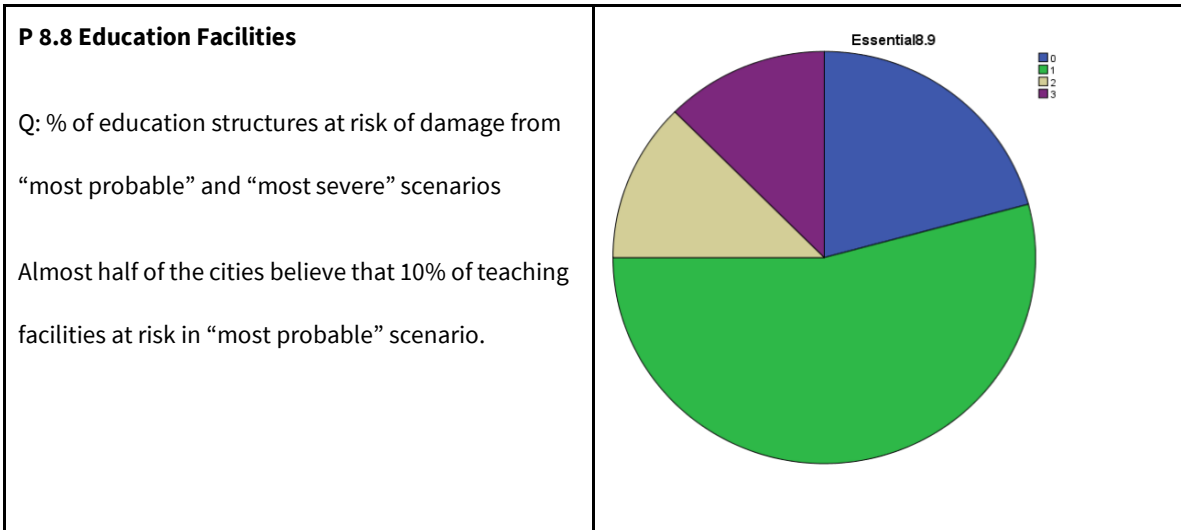
Examples of protective infrastructure:

- Levees and flood barriers;
- Flood basins;
- Sea walls (where used);
- Shelters, such as tornado/hurricane shelters;
- Storm drains and storm water holding tanks;
- Wetlands and mangroves (see Essential 5);
- Shock absorption capabilities fitted to infrastructure to deal with earthquakes.



<p>P 8.3 Water - Potable and Sanitation</p> <p>Q: Would a significant loss of service for these two essential services be expected for a significant proportion of the city under the agreed disaster scenarios?</p> <p>Significant loss of service would be experienced from the “most probable” scenario in 40% of the cities agreed on (Answer 1)</p>	<p style="text-align: center;">Essential8.3</p> <table border="1"> <caption>Data for Essential8.3</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>20%</td> </tr> <tr> <td>1</td> <td>40%</td> </tr> <tr> <td>2</td> <td>40%</td> </tr> </tbody> </table>	Response	Percentage	0	20%	1	40%	2	40%		
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<p>P 8.4 Energy</p> <p>Would a significant loss of service be expected for a significant proportion of the city in the ‘worst case’ scenario event? In the event of failure would energy infrastructure corridors remain safe (i.e. free from risk of leaks, electrocution hazards etc.)?</p> <p>60% of the cities agreed that significant loss of service would be experienced from the “most probable” scenario. (Answer 1)</p>	<p style="text-align: center;">Essential8.4</p> <table border="1"> <caption>Data for Essential8.4</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>15%</td> </tr> <tr> <td>1</td> <td>60%</td> </tr> <tr> <td>2</td> <td>25%</td> </tr> </tbody> </table>	Response	Percentage	0	15%	1	60%	2	25%		
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<p>P 8.5 Transport</p> <p>Q: Would a significant loss of service be expected for a significant proportion of the city in the ‘worst case’ scenario event? In the event of failure would transport infrastructure corridors remain safe (i.e. free from risk of flood, shocks etc) and passable?</p> <p>Significant loss of service would be experienced from the “most probable” scenario in 40% of the cities</p>	<p style="text-align: center;">Essential8.5</p> <table border="1"> <caption>Data for Essential8.5</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>15%</td> </tr> <tr> <td>1</td> <td>40%</td> </tr> <tr> <td>2</td> <td>40%</td> </tr> <tr> <td>3</td> <td>5%</td> </tr> </tbody> </table>	Response	Percentage	0	15%	1	40%	2	40%	3	5%
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<p>(Answer 1).</p>											
<p>P 8.6 Communications</p> <p>Would a significant loss of service be expected for a significant proportion of the city in the 'worst case' scenario event?</p> <p>52% of the cities agreed that some loss of service would be experienced from the "most severe" scenario (Answer 2).</p>	<p>Essential8.6</p> <table border="1"> <caption>Data for Essential8.6</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>10%</td> </tr> <tr> <td>1</td> <td>35%</td> </tr> <tr> <td>2</td> <td>45%</td> </tr> <tr> <td>3</td> <td>10%</td> </tr> </tbody> </table>	Response	Percentage	0	10%	1	35%	2	45%	3	10%
Response	Percentage										
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<p>P 8.7 Health care</p> <p>Q: Would there be sufficient acute healthcare capabilities to deal with expected major injuries in 'worst case' scenario?</p> <p>Less than half of the cities believe that 90% of major injuries in "most severe" scenario, can be treated within 36 hours.</p>	<p>Essential8.7</p> <table border="1"> <caption>Data for Essential8.7</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>25%</td> </tr> <tr> <td>1</td> <td>45%</td> </tr> <tr> <td>2</td> <td>15%</td> </tr> <tr> <td>3</td> <td>15%</td> </tr> </tbody> </table>	Response	Percentage	0	25%	1	45%	2	15%	3	15%
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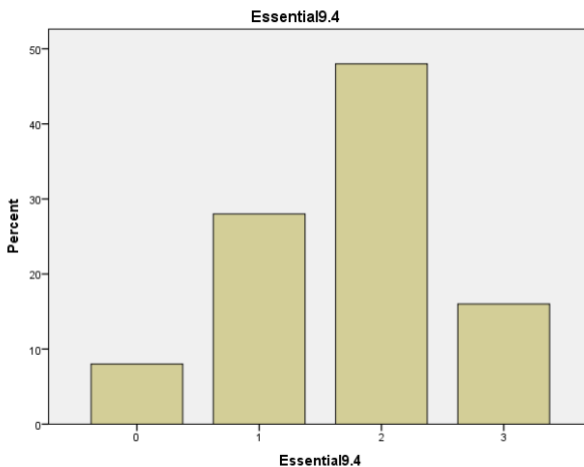


<p>P 9.2 Event Management Plans</p> <p>Q: Is there a disaster management/ preparedness / emergency response plan outlining city mitigation, preparedness and response to local emergencies?</p> <p>60% of the cities scored moderately high (Answer 2 - comprehensive plan exists but it contains significant gaps in coverage for city mitigation, preparedness and response to local emergencies).</p>	<table border="1"> <caption>Essential9.2 Data</caption> <thead> <tr> <th>Score</th> <th>Percent</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>12</td> </tr> <tr> <td>1</td> <td>20</td> </tr> <tr> <td>2</td> <td>60</td> </tr> <tr> <td>3</td> <td>8</td> </tr> </tbody> </table>	Score	Percent	0	12	1	20	2	60	3	8
Score	Percent										
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<p>P 9.3 Staffing /responder needs</p> <p>Q: Does the responsible disaster management authority has sufficient staffing capacity to support first responder duties in surge event scenario?</p> <p>Coverage of all neighborhoods within 48-72 hours applies in 60% of the cities (Answer 1).</p>	<table border="1"> <caption>Essential9.3 Data</caption> <thead> <tr> <th>Score</th> <th>Percent</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>20</td> </tr> <tr> <td>1</td> <td>55</td> </tr> <tr> <td>2</td> <td>15</td> </tr> <tr> <td>3</td> <td>8</td> </tr> </tbody> </table>	Score	Percent	0	20	1	55	2	15	3	8
Score	Percent										
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P 9.4 Equipment and relief supply needs

Q: Are equipment and supply needs, as well as the availability of equipment, clearly defined?

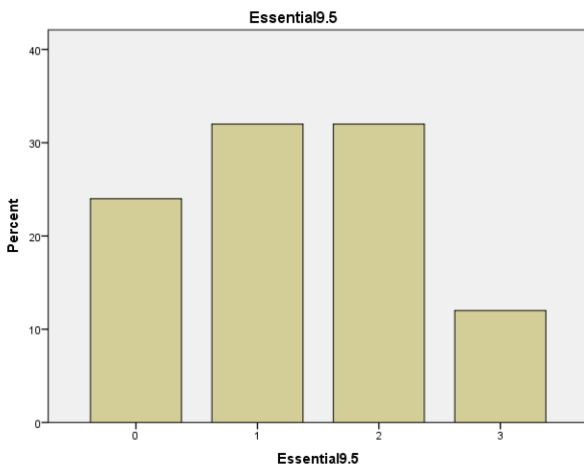
48% of the cities need defined, linked to disaster scenarios (Answer 2).



P 9.5 Food, shelter, staple goods and fuel supply

Q: Would the city be able to continue to feed and shelter its population post-event?

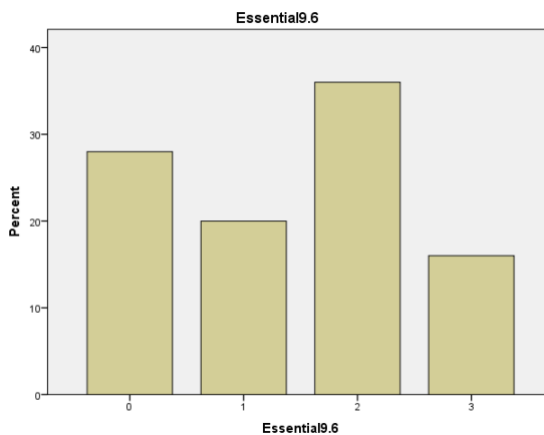
A percentage of 32% was evenly distributed for answers (1- In “most severe” scenario, supply of emergency food and basic relief items is less than estimated need by 2% or more) and Answer (2- In “most severe” scenario, supply of emergency food and basic relief items is equal to estimated need).



P 9.6 Interoperability and interagency Working

Q: Is there an emergency operations center, with participation from all agencies, automating standard operating procedures specifically designed to deal with “most probable” and “most severe” scenarios?

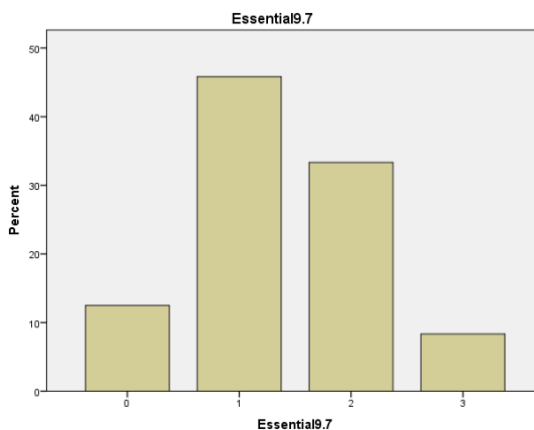
36% of the cities agreed that emergency operations center exists with hardened / redundant communications, designed to deal with “most severe” scenario; core agencies only participate (Answer 2).



P 9.7 Drills

Q: Do practices and drills involve both the public and professionals?

44% of the cities selected (Answer 1) With ad hoc partial exercises available, but not all scenarios tested, not realistic. Taking into account that this differs from Skills training previously covered in (Essential 6).

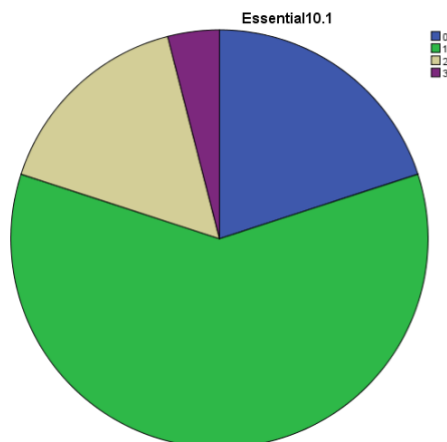


Essential 10: Expedite Recovery and Build Back Better

P 10.1 Post event recovery planning – pre event

Q: Is there a strategy or process in place for post-event recovery and reconstruction, including economic reboot, societal aspects etc.?

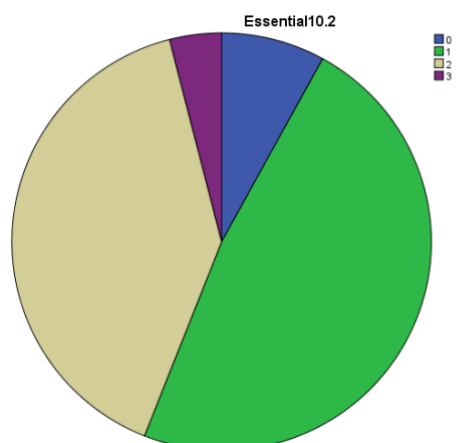
Over half of the cities have some plans / strategies exist but they are not comprehensive or joined up or understood by relevant stakeholders (Answer 1).



P 10.2 Lessons learnt /learning loops

Q: Do post-event assessment processes incorporate failure analyses and the ability to capture lessons learned that then feed into design and delivery of rebuilding projects?

Around 48% of the cities have some lessons are captured and disseminated but not in a thorough or systematic way (Answer 1)



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